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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of Unesco)

Eleventh Session of the IOC Working Committee on IODE
U.N. Headquarters, New York, 9-18 January 1984

SUMMARY REPORT

(SC-84/CONF.201/COL.26)

1. OPENING OF THE SESSION

The Eleventh Session of the IOC Working Committee on International Oceanographic Data Exchange was opened by the Chairman, Mr. Dieter Kohnke, at 10.00 a.m. on 10 January 1984. He welcomed Mr. P.N. Dhar, United Nations Assistant Secretary-General for Development Research and Policy Analysis, Mr. J.P. Lévy, Chief of the United Nations Ocean Economics and Technology Branch, Mr. D. Diene, the Representative of the UNESCO Liaison Office at the United Nations and those present at the Session. He then expressed his sincere thanks to the host organization for the excellent meeting arrangements and the assistance which had been provided by the United Nations and, in particular, UN/OETB in organizing this session. He invited Mr. P.N. Dhar to address the participants.*

Mr. Dhar addressed the Working Committee and conveyed to the participants the best wishes of the Secretary-General. He then stressed the increasing demands placed on the IOC and on the United Nations System as a whole in the area of oceanographic research as a result of various intergovernmental fora such as the United Nations Conference on Science and Technology for Development and the recently concluded United Nations Conference on the Law of the Sea.

Optimum use of the world's oceans requires international co-operation. A vital element for such international co-operation and research is the ability to pool data and information collected and stored by countries that study and use the ocean and its resources. He emphasised that IOC, through its Working Committee on International Oceanographic Data Exchange, provides a focal point for the exchange of data among its Member States. He noted that the Working Committee guided the establishment of rules and procedures to facilitate the international exchange of different types of oceanographic data; assisted in the creation of the Marine Environmental Data and Information Referral System (MEDI) and the Aquatic Sciences and Fisheries Information System (ASFIS).

Mr. Dhar paid special attention to the importance of close inter-agency co-operation and collaboration and expressed his appreciation of the strengthening of co-operative links between the United Nations Secretariat and the IOC (and its Working Committee on IODE) in the field of marine mineral information and data exchange. He underlined that this co-operative effort had been successful and of mutual benefit to the United Nations and the IOC.

In concluding, Mr. Dhar noted that the time was opportune for the Committee to consider its information policy and to consolidate its activities in the scientific information and data fields. To meet the changing requirements of marine scientific research, the Committee might wish to consider new mechanisms and methods of work and should make more effort in instituting building and training programmes in information and data services in developing countries.

The full text of Mr. Dhar's introductory address is given in Annex IV.

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*The list of participants is given in Annex III.

The Chairman of the Committee thanked Mr. P.N. Dhar for his kind and encouraging words. He then identified two major issues the Working Committee on IODE is faced with:

- a continuing demand to adjust its exchange procedures and management mechanisms to emerging international scientific programmes and measuring techniques;

- to develop the oceanographic exchange and marine information management under the new ocean régime.

The Chairman of IODE emphasized the importance of decisions taken at this session for the future work of IOC in the field of information and data management. Mr. D. Kohnke reminded the Committee that pursuant to an agreement of the Third IODE Consultative Meeting (Paris, 24-27 January 1983), two lecturers had been invited to speak on scientific topics with implications on the future work of the Working Committee on IODE:

- Professor F. Webster, U.S.A. - "Some Ocean Data Needs of the World Climate Research Programme"

- Dr. N.C. Flemming, U.K. - "Implications of the New Ocean Régime, particularly the Convention, on the International Oceanographic Data Exchange"

Abstracts of these lectures appear in Annex V.

Mr. D. Kohnke thanked the eminent scientists for their interesting and valuable lectures and invited the Committee to discuss challenging subjects.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF THE AGENDA

The Agenda was adopted as given in Annex 1.

2.2 DESIGNATION OF THE RAPPORTEURS

Dr. N.C. Flemming, (UK) and Mr. Freeman (USA) were proposed by their respective delegations to be co-rapporteurs. This proposal was seconded by several Member States and thus Dr. Flemming and Mr. Freeman were designated as co-rapporteurs.

2.3 ARRANGEMENTS FOR THE SESSION

The IOC Assistant Secretary, Dr. I. Oliounine, introduced the proposed time schedule, identified changes in the list of documents and informed the Committee on administrative arrangements.

Though it was expected to work in Plenary, the Committee recommended the establishment of a number of ad hoc drafting groups to deal with specific agenda items.

3. WORK ACCOMPLISHED DURING THE INTERSESSIONAL PERIOD

The Chairman summarized activities of the Working Committee on IODE during the intersessional period 1981-1983, and described the activities that the Committee had undertaken during this period. He emphasized the importance and usefulness of conclusions of intersessional IODE consultative meetings in providing guidance to the subsidiary bodies of the Committee during the intersessional period.

The major requirements for new initiatives which had emerged during the intersessional period were as follows:

- the urgent need for a new method for co-ordinating the various marine information activities of IODE;
- the need for new capabilities to provide large-scale data and information services in support of global international scientific programmes such as WCRP;
- continued development of the successful RNODC system;
- standardization, expansion, and acceleration of the international exchange of oceanographic data;
- the need for an increased level of support of training activities through the IOC Training, Education and Mutual Assistance in Marine Sciences (TEMA).

The Committee accepted the report of the Chairman and expressed its appreciation of the activities accomplished by the Chairman, IODE Officers, and the IOC Secretariat during the intersessional period.

There was an extensive discussion of the document (IOC/IODE-XI/1.1 and its Supplement I) which contained Reports of National Co-ordinators for IODE, and Technical Potentialities of Oceanographic Data Centres. The Committee expressed concern on the late submission of national reports to the IOC secretariat for publication and urged IODE National Co-ordinators to arrange for timely submission. The Committee was invited to express an opinion as to whether this kind of report was useful. There was strong support for the usefulness of the document. However, it was suggested that the two types of information which are now contained in the report, namely, descriptions of new data sets and acquisition and discussion of technical matters and problems, should be separated.

The information on technical potentialities of National Oceanographic Data Centres had been obtained with a good response from Member States, producing 22 replies. This response is very satisfactory, since there are only 28 NODCs and 8 DNAs officially established. The results of the survey show that most centres do have the staff and facilities to meet the increasing

requirements for oceanographic data and data products. The geographical distribution, however, is far from adequate, since very few centres exist in Africa, Asia, or Central America. The Committee agreed that special attention should be paid to the range of output products, since there are now urgent demands from both national and international users.

During the intersessional period, the World Data Centres, A and B, Oceanography (operating in Washington, D.C., U.S.A., and Moscow, U.S.S.R., respectively) continued to acquire substantial volumes of marine scientific data, to systematize, store and exchange these data. The Directors of World Data Centres introduced status reports and highlighted the activities of these respective Centres for the period 1981-1983 (Doc. IOC/IODE-XI/10).

WDC-A, Oceanography

Data were received from 33 countries with the total number of observations exceeding 160,000. Data from more than 77,000 oceanographic stations were received as well as other types of observations, including more than 22,000 bathythermograph observations, 7,500 biological observations, and 51,700 surface and subsurface current measurements. The number of observations for which data are now on hand for these categories are 301,000 bathythermographs, 112,500 biological observations, and 557,500 current measurements. The international marine data base of the Centre now contains data for more than 1,785,000 observations. All data held by the Centre are identified and described in Change Notices to the Catalogue of Data.

Reports on Oceanographic Data Exchange for 1981 and 1982 published by the Centre, provide the readers with information received during 1981 and 1982. A substantially lower percentage (16.5%) of the stations data cruises could be identified as being part of cruise programmes listed in NOPs and DNPs.

The WDC-A annual reports also summarize, by ship, the number of Report of Observations/Samples Collected by Oceanographic Programmes (ROSCOP) international marine data inventory forms received by WDC-A. During the intersessional period, a total of over 2,800 ROSCOP forms were received from 21 countries. More than 14,000 ROSCOP forms are now on hand at the Centre. ROSCOP forms have been received from 34 countries. All ROSCOP forms received by WDC-A are copied to WDC-B.

More than 2,900 marine scientific publications and articles have been received by WDC-A during the period since IODE X. All documents received by WDC-A are referenced and indexed by keyword and author in yearly supplements to the catalogue of Accessioned Publications.

All the above-mentioned documents published by WDC-A are available free of charge upon request.

It was also important to note that a new World Data Centre A, Marine Geology and Geophysics subcentre has been created in Boulder, Colarado. WDC-A Oceanography is no longer responsible for the exchange of marine geological and geophysical data.

WDC-A, Marine Geology and Geophysics (MGG)

The report of the Director of WDC-A-MGG was combined with his report as Chairman of the Task Team on Data on Non-Living Resources in the Ocean and is found under Agenda Item 5.4.

WDC-B, Oceanography

In the period covering 1981, 1982 and the first half of 1983, WDC-B received data from 37 countries and a total of 1,258 cruises, practically the same figure as for the periods 1977-1978 and 1979-1980, which is somewhat lower than for the years from 1971 to 1975. The overall number of cruises recorded up to 1 July 1983 was 13,116.

The material received during the intersessional period involved 124,015 oceanographic stations, 54,542 bathythermograph observations, 145,531 measurements of surface currents, 5,573 measurements of subsurface currents, 12,718 biological observations and 12 cruise reports containing geophysical data.

The international data stored in WDC-B features about 850,000 oceanographic readings. A summary of all these data is given in the bi-annual data catalogue. This catalogue is regularly circulated among the international community free of charge.

At present WDC-B is able to receive information on magnetic tapes of GF-3 format and in the various national formats.

Unfortunately, the submission of data to WDC-B after the time limits laid down in the Manual on IODE continues to take place. During the intersessional period most data received was from expeditions that took place between 1976 and 1980. By the beginning of the 1980s, 50 per cent of the data submission had been affected by a 10 year delay.

There has been a tendency of late towards a change in the volume of the various types of information transmitted; there has been a notable increase in the number of bathythermographic readings, of data on surface and subsurface currents and data on STD. At the same time the number of traditional oceanographic readings has remained more or less constant, whereas the amount of hydrochemical observations has substantially decreased. Special concern was expressed on the exchange of data on marine biology, the submission of which has dropped to just over half its 1979 level. Only a few countries offered geophysical data and data on currents for exchange.

WDC-B continued to receive information on planned and completed cruises from Declared National Programmes and ROSCOP forms, as well as from reports and (national) programmes sent in special bulletins by countries co-ordinating projects; yet many countries do not send in their DNPs, and make mistakes in filling out their ROSCOP forms, which makes the work of the Centre more difficult.

The amount of information on cruises received by WDC-B on ROSCOP forms has considerably increased. In all, ROSCOP forms on 10,500 cruises from 24 countries were submitted, including 2,400 forms from 18 countries in 1980-1981.

The Committee noted with great interest Reports of the Directors of WDCs for Oceanography and requested the Secretary of IOC to continue his effort in urging IOC Member States to strictly follow the procedures established in the guiding documents for International Oceanographic Data Exchange. In this context, the Committee noted that in some countries, the conditions of operating or research grants are being used to speed up data delivery to NODCs.

The Committee recommended to continue the practice of ROSCOP submission as an important component of the whole IODE System, to consider ROSCOP as an IODE inventory system, and to accept the French's offer to establish an on-line ROSCOP system.

The Committee noted with satisfaction a tendency to increase data submission on magnetic tapes and stressed that the changeover to data exchange on magnetic tapes would make it possible to reduce considerably accessing time for the IODE system which is of a particular importance for the WCP.

The Committee noted with concern that in spite of the obvious and generally acknowledged need for data to be submitted to the World Data Centres in order to ensure the most efficient possible service for scientists of all countries, the rate of data submission to the WDCs by NODCs is far from that desired. It was agreed that as one of the tools for facilitating data submission to the IODE system the more active participation of data managers in the planning of oceanographic research projects and in the control of the access of these data to the WDCs should be used. The Committee also urged that national co-ordinators for IODE bring this matter to the attention of appropriate authorities in their respective countries.

4. DEVELOPMENT OF IODE COMPONENTS

4.1 RESPONSIBLE NATIONAL OCEANOGRAPHIC DATA CENTRES (RNODC)

The Committee received the report on the activities of the Group of Experts on RNODCs during the intersessional period (IOC/IODE-XI/12). The Fourth Session of the Group was held in Washington in 1982 at which new responsibilities of the Group were discussed and terms of reference reviewed (Doc. IOC/RNODC-IV/3). One of the achievements of the Group was the publication of the Guide for RNODC where the procedure for the accreditation of a new RNODC was described.

Now that the RNODC concept has become operational, the main task of the Group of Experts is to provide support to the network of RNODCs. The need for a number of new RNODCs was identified.

There was some concern expressed relevant to the text of the Guide and a proposal was made to continue improving the work in order to keep the publication up-to-date and in line with new technology and trends.

Discussions centred on the mechanism for designating and accrediting new RNODCs. Although a mechanism exists for designation during intersessional periods, sometimes it takes years to take a final decision. The necessity of developing a statement of technical requirements and then locating a national centre that has the expertise and the resources to serve as an RNODC is time consuming.

The Committee was informed on developments in the establishment of RNODCs for "El Nino", drifting buoys, JASIN and Remotely Sensed Wave Climatology. Except for the official proposal of the RNODC-Waves to extend its terms of reference with a view to including remotely sensed wave data, none of the other official offers were submitted to the Group of Experts for consideration. The Committee urged that Letters of Intent to become an RNODC should be provided to the Group of Experts prior to September 1984. It is then hoped that recommendations to accredit relevant RNODCs could be made during the meeting.

The Committee approved the Report of the Chairman of the Group of Experts and new Terms of Reference as they are presented in Recommendation IODE-XI.1.

The Committee realized that if an offer was made but no decision of acceptance was taken for a lengthy period, the momentum needed to achieve the objectives might be lost even if the resources were still available.

The Committee agreed that to avoid the loss of resources and interest within national governments that offer to sponsor RNODCs, a prompt execution of the established procedures is needed.

The Committee expressed appreciation of the kind offer of the Soviet Union to host the Fifth Session of the Group of Experts in Moscow in the autumn of 1984.

4.2 FORMAT DEVELOPMENT

The Chairman of the Group of Experts on Format Development introduced his report (Doc. IOC/IODE-XI/15) and the Summary Report of the Second Session of the Group of Experts (Doc. IOC/IODE-GFD-II/3) which summarize the activities of the Group during the intersessional period.

The Group of Experts has concentrated heavily on the development of subsets of the GF-3 Format so as to accelerate the transfer of large data sets of commonly required data between data centres, and to as many users as possible. Standard GF-3 subsets have been completed and deposited with the RNODC Formats for: moored current meter data, mean sea level data, drifting buoy data, and CTD data; digital wave data, wave height and wave period data, and non-directional wave spectra. Further work is required on standard subsets for XBT/MBT and Water Bottle Data in consultation with experts from ICES and the Joint IOC/WMO Working Committee for IGOSS.

The Committee noted that work has started on the definition of GF-3 subsets for biological, geological and geophysical data. Work on the geophysical subset, bathymetry, magnetics, gravity, is proceeding in collaboration with the Task Team on Data on Non-Living Resources and on biological data with the Task Team on Marine Biological Data. Consideration has been given to subsets for SEA-BEAM and Bathymetric Data.

The Committee approved the Report of the Chairman and appreciated the effort of the Group in the development and implementation of GF-3, in particular the contribution of experts from Canada and UK. The Committee agreed that the GF-3 format had reached the stage where it could be widely used for data exchanged. The Committee recommended that the amendments proposed to the technical specification be adopted and deposited with the RNODC Formats and distributed to holders of the Technical Specification. Because ROSCOP and its contents are key elements in data exchange, referral systems, and inventory systems, the Committee requested that the GE/Formats review the adequacy of the present form and propose revisions as may be necessary.

It was noted that the JASIN Data Set, consisting of records of airborne meteorology, sonde meteorology, balloon data, wave-buoy data, met-buoy data, thermistor, current meter, Batfish, water bottle, and vertical current records, could all be transferred to GF-3 with minimum complexity.

The Committee emphasized the importance of the development of the portable software, GF-3 Proc which will assist international communities in reading and writing GF-3 tapes. GF-3 Proc will include four sections: User Guide Installation Guide, Maintenance Guide and the software itself on magnetic tape. The Committee urged the Group of Experts on Format Development to continue development of the GF-3 Proc. The Committee reviewed the text of a brochure describing the GF-3 format and recommended that after some minor textual and design changes it should be printed and widely distributed.

The Committee expressed its appreciation to the representative for ICES for publication of the first Newsletter on Format Development, and welcomed the kind offer to host the next meeting of the Group of Experts on Format Development in Copenhagen in 1985.

4.3 EXCHANGE OF AIRBORNE AND SATELLITE REMOTELY SENSED OCEANOGRAPHIC DATA

The Committee approved the report of the Chairman of the Task Team on Exchange of Airborne and Satellite Remotely Sensed Oceanographic Data (Doc. IOC/IODE-XI/16).

The main activity of the Task Team during the intersessional period has been to set up a MEDI Catalogue of remotely sensed data. Favourable responses for contribution to the Catalogue were received from a number of countries. The Task Team co-operated with ESA, WMO, and other relevant organizations on this matter.

The Committee realized the fact that there is still much to be done regarding the awareness of availability of remotely sensed data of the oceans and that, especially in developing countries, problems still exist in the process of obtaining and analyzing remotely sensed data.

In this context, NODCs and RNODCs were requested to be prepared to act as focal points for information and requests concerning remotely sensed data of the oceans. From those countries with established national focal points for remotely sensed data, a link should be maintained between the NODCs, RNODCs and this national focal point.

The Committee noted the importance of timely and good quality sea-truth observations to complement remotely sensed data and information. In this context, Member States were requested to ensure that sea-truth measurements be submitted in a timely manner to their respective NODCs and RNODCs.

The Committee noted that the most commonly requested geophysical parameter from the World Data Centre Geophysics is airborne magnetics. There are huge world collections of this type of data, and formats for its exchange are in an advanced state of development.

The Committee recommended the Secretary IOC to:

- urge the satellite operating agencies of Member States to keep RNODCs and NODCs informed about relevant developments regarding remote sensing data of the oceans;

- complete the publication of Satellite and Aircraft Sections of the MEDI Catalogue in 1984;

- urge Member States to submit to IOC Secretariat for further distribution to RNODCs and NODCs a comprehensive listing of service organizations having the capabilities to conduct analysis of remote sensing data and information (especially digital image analysis, numerical modeling, etc.) for users not possessing these capabilities;

- urge Member States having satellite operating agencies to:

  (a) consider whether, for oceanographic applications, especially for co-ordinated programmes and developing countries, a reduced price could be applied to data requested through the IODE network;

  (b) request these agencies to submit and keep up-to-date their input to the MEDI specialized catalogue on remote sensing data.

The Committee received with interest the information provided by the representative of the United Nations Outer Space Affairs Division, and noted that the Division had been authorized by the United Nations General Assembly of 1973 to act as a clearing house for all aspects of applications of space technology.

In this context an international space information service will be established. To support the United Nations effort, the Federal Republic of Germany has offered to host the United Nations International Meeting of Experts on Remote Sensing Information Systems in May 1984. The meeting will discuss information systems, assistance to developing countries, real-time satellite communications, training, and publications, and will include aspects of marine research and applications. The whole scope of the meeting is very important and the Committee requested the Secretary IOC to ensure the participation of an IODE representative at the meeting.

The Committee requested the Director of the RNODC Waves to keep the Task Team on remote sensing data informed about the developments of the proposal concerning the wave data from the ERS-1 satellite, in order for the Task Team to be able to react soonest upon possible requests for assistance. The Committee approved the Task Team's plans to co-operate with ESA in order to ensure maximum benefit from the data obtained from the ERS-1 satellite; to produce a directory of services and data centres providing assistance in data processing of remotely sensed data. The Committee decided to continue the Task Team with the same Terms of Reference.

4.4 MARINE BIOLOGICAL DATA

The Chairman of the Task Team reported (Doc. IOC/IODE-XI/17) that though there had been an active intersessional programme with significant progress, no tasks had been completed. As a follow-on to the determination of needs done by a world-wide survey in 1980-1981, the Task Team now requires greater knowledge of Member States' intentions for managing and exchanging marine biological data to help to establish priorities for types of data for which it will develop formats.

The Committee agreed that the use of the GF-3 format is possible for data not related to specific species of organisms.

Species-dependent data also should be coded into GF-3 so that standard software can be used to find both parameters and species. In order to do this, however, a global taxonomic coding scheme is needed. To be suitable for this purpose, such a scheme needs to be maintained and updated continuously and to be compatible with the GF-3 format. No single existing taxonomic code appears to be adequate, but the Task Team is continuing to study candidates that could be suitable.

The Committee was reminded of some independent efforts of other international agencies with similar goals. For example, a co-operative SCOR/SCAR project is working on international marine biological data management as part of the Southern Ocean Ecosystem Biomass Programme.

The Committee felt it premature to have an RNODC for marine biological data due to the fact that not many Member States have been exchanging marine biological data via the World Data Centre System and felt also that at this stage such

exchange might be facilitated by the extension of the GF-3 format for marine biological data.

The Committee proposed that the Task Team would continue its activities for the next intersessional period with modified Terms of Reference. Resolution IODE-XI.1 was adopted.

4.5 STANDARD CRITERIA FOR PHYSICAL OCEANOGRAPHIC DATA

Since the Chairman of the Task Team had retired, the report was presented by the Chairman of the ICES Working Group on Marine Data Management (Doc. IOC/IODE-XI/18). Guidelines had been developed in collaboration with the ICES Working Group on Marine Data Management for the exchange of moored current meter data, CTD/STD data and XBT data. The Guidelines for CTD/STD data were drafted in co-operation with SCOR Working Group 51, and recommend that data exchanged internationally should not be at high resolution, unless special reasons apply. The new proposal for XBT data updates the earlier ICES 1969 standard. The Committee noted that the development of Guidelines for international exchange of specific types of data, defining calibration, data reduction, data documentation, etc., was a natural precursor to development of a GF-3 subset for that data. The results of deliberations on Guidelines have been included in the revised version of the IOC Manuals and Guides No. 9.

The Committee agreed that the Task Team has completed its responsibilities identified in its Terms of Reference and decided to disband the Task Team. The Committee recommended that a Rapporteur on the same subject should be appointed to be the focal point.

4.6 MEASURED WAVE DATA MANAGEMENT

The Committee considered and approved the report of the Chairman of the Task Team on Measured Wave Data Management (Doc. IOC/IODE-XI/19). It was noted that GF-3 subsets have now been prepared for digital wave records, wave-height period data, and measured wave spectra, and that the format specifications have been transferred to the RNODC Formats. Drafting has started on a User Guide for the exchange of measured wave data. The completion of a GF-3 subset for directional spectral data is highly complex, in view of the differing sensors used to measure directional spectra, and the range of analytic techniques used to derive spectral parameters. It is therefore difficult to produce a precise list of standard parameter codes, each of which needs to be very carefully defined. It is anticipated that regular exchange of wave data in GF-3 format will start from next year.

With special interest the Committee considered the report of the WMO representative on the WMO wave programme and comments of the IODE experts on this programme. The Committee realized the big input of the WMO, and especially its Commission on Marine Meteorology, to the observation and forecasting of wind waves and swell in the World Ocean. It was noted that a Handbook on Wave Analysis and Forecasting had been prepared by WMO in 1971, and that this now would be revised to take into account the needs of the WMO Wave Programme. The main interests of WMO continues to be in ship navigation and the safety of offshore structures and operations. Wave forecasts are largely based on wind data and

verifed using visual observations of waves or measurements as available. It was important that existing wave data services should make subsets of the data available in real time, and that there should be an agreement on the use of standard technical terms.

The Committee took the view that real time measured wave data can be extremely useful in conjunction with wave model forecast operations. The real time data can be used to calibrate and improve the performance of models; can be used as a monitor or check on the output from models when forecasts are being generated; and ultimately the real time data on measured waves could be assimilated on-line into the models, thus improving the forecasts automatically.

While the WMO has a primary interest in real time data and forecast, IODE has a primary interest in archived data and climatic statistics. To ensure efficient use of measured wave data for these two purposes, IOC/IODE and WMO/CMM should co-operate closely. It was noted that WMO has proposed a meeting of experts in Geneva to revise the Handbook on Wave Analysis and Forecasting, and members of the IODE Task Team on Wave Data Management had offered to attend.

The Committee stressed the importance and co-operation of IOC and WMO experts on a range of topics, including calibration between existing wave measuring systems, monitoring new wave measuring systems, preparing manuals of practice in wave measurement, establishment of compatible codes for real time data and archival data systems, encouraging existing wave data sources to make data available in real time, experimental and theoretical work on wave generation by winds, definition of technical terms and the specification of methods for archiving wave data.

The Committee noted with appreciation the activities and developments under the RNODC Waves. As it was requested at IODE-X, the RNODC Waves has compiled the first draft of a catalogue of Wave Models to supplement the Wave Data Catalogue, the second edition of which contained 1974 entries and was distributed in 1982. Co-operation with WMO has been established to increase the number of national representation submitting information to the catalogue. The importance of the Wave Data Catalogue for location and accessibility of data was mentioned.

The Committee agreed that the Task Team would continue its functions as outlined in Resolution IODE-XI.2 which was adopted.

4.7 DEVELOPMENT OF IODE DATA CENTRE SERVICES

The Chairman of the Task Team on Data Centre Services presented the report to the Committee (Doc. IOC/IODE-XI/20), which was approved. The Task Team has identified a major concern with the inherent problems in the production of large oceanic or global data presentations, where the IODE community at present is less concerned with timely data reduction, algorithms to convert raw data to merged standard data sets, quality control and gridding. International experiments at present planned, e.g. TOGA and WOCE, are specifically requesting oceanographic data in this form. The Committee was pleased to note the progress made by the Task Team in refining its objectives and identifying the key areas of concern in relation to data products. A questionnaire had been circulated to data centres requesting information on the data products which they currently provide in relation to different data sets. This survey supplemented MEDI information in that it provided an insight into the services and data products available.

The Committee agreed that there was a need to inform scientists and potential users of data centres of the wide range of routine services and local or regional data products which could be obtained. Such information would also assist developing countries seeking to identify useful data products which could be generated by their data centres. It was recognized that there was no necessity to seek standardization of such local data products, but that it was advantageous to illustrate alternative methods and techniques. The Task Team should consider the possibility of a catalogue of typical data products. It was noted that data centres should use their own resources to publish much more information about their available data products.

The Committee proposed that in the next intersessional period the Task Team would concentrate on an assessment of the data presentation requirements of international experiments and programmes, and to try and identify those data types which could most effectively be managed by IODE, with a view to the definition of the technical problems involved and resources required in data presentation.

In order to achieve the objectives the Committee agreed that the Task Team will continue its activities through the next intersessional period, with altered Terms of Reference so as to narrow the focus of work onto precise problems. Resolution IODE-XI.3 was adopted.

4.8 ANNOUNCEMENTS OF DECLARED NATIONAL PROGRAMMES/NATIONAL OCEANOGRAPHIC PROGRAMMES (DNP/NOP)

The Chairman of the Task Team on Review of DNP/NOPs presented the report which was approved by the Committee (Doc. IOC/IODE-XI/21). The Committee recognized the difficulty experienced by many IOC Member States in following the procedure of DNP/NOPs. DNP represents the commitment of Member States to exchange the resulting data on the IODE System, whereas an NOP is only a matter of information that the cruise or experiment will be carried out. It was noted that Member States publishing their future plans tend to classify all their cruises as either DNP or NOP, thus failing to make the distinction. Though publication of future plans assist all States to identify means of improved co-operation, it should be accepted that some announced DNPs may either not take place, or the scientists concerned may consider, after the completion of the expedition, that the data quality does not warrant international exchange.

It was recognized that the pre-announcement of cruise plans served many other purposes than data management, especially encouraging co-operation within the context of TEMA. The representative of WDC-B Oceanography stated that the number of DNPs and the number of States submitting DNPs was increasing steadily. However, the percentage of DNPs which resulted in submitted data is falling. The percentage of DNPs which resulted in data submitted to the WDC system averages only 17 percent and varies from 10 percent to 40 percent between countries. Some countries submit no DNPs but do submit data to WDC-B. In order to streamline the procedure, the Committee decided that it would be preferable to standardize the form for reporting DNP/NOPs. The Committee agreed that the Task Team would continue its work and took into account proposals made at the Session. Resolution IODE-XI.4 was adopted.

4.9 MARINE ENVIRONMENTAL DATA INFORMATION REFERRAL SYSTEM (MEDI)

The background and proposals of MEDI were reviewed by the Chairman of the Group of Experts on MEDI. He emphasized that MEDI is intended to be an inter-agency and interdisciplinary service to provide means for better access to marine environmental data. MEDI is intended to be a general purpose marine data referral system.

MEDI is operational with a data base that uses the UNESCO computer system and a published catalogue. Some 270 data files from 58 sources had been catalogued by the end of 1983. Within the past year, MEDI had been used as a vehicle to catalogue descriptions of satellite data.

Although MEDI is a good demonstration product, it has not yet reached its full potential. The Chairman of the Group of Experts suggested several reasons for this:

- MEDI data base is too small and the response of IODE national centres to request for descriptions of their data files has not been complete;

- the management mechanism, a small Group of Experts supplemented by invited experts from international agencies, has not been effective;

- the level of staff allocated to operation of MEDI at the IOC Secretariat has not been sufficient to permit rapid progress or adequate co-ordination within UNESCO;

- the introduction of on-line computer search and retrieval capability for MEDI on the UNESCO computer system has been delayed;

- the UNESCO computer system, which is the only host for MEDI at present, is not accessible to users outside UNESCO.

The Committee concluded that some steps need to be taken to realize the potential of MEDI. Regarding organizational management, the Chairman of the Group of Experts referred to proposals that had been made in the Summary Report of the Meeting of the Task Team on IODE's role in marine information management. On the technical aspects of MEDI, the Committee was of the opinion that better accessibility would result in greater use of MEDI if the information it contains is of value. Likewise, more needs to be known about the actual requirements that could be met by MEDI. It was felt that the coverage of MEDI needs to be expanded and the input procedures could be simplified. The proposed Group of Experts should review these matters. The Committee stressed that the most important use might be to lead non-oceanographic experts to discover available oceanographic data that could serve their programmes. Additional participation by international centres in related fields, such as meteorology and fisheries also would be welcome. The Committee adopted Recommendation IODE-XI.2.

The Committee noted with appreciation the offer of France to install the MEDI data base in an on-line computer system at BNDO at Brest. Manuals to teach users how to use the system could be provided. While the offer was welcomed with thanks, there was some concern over whether on-line access would be available in areas not well served by telecommunication networks, such as the Indian Ocean region. The on-line system would be considered as a pilot project which may provide valuable information when considering the re-design of the MEDI system. In some cases, on-line access may not be practical or desired by users. For these users, the MEDI catalogue is a very important and useful tool. The Committee accepted the effort by the IOC Secretariat to publish a new edition of the catalogue this year.

The Committee was informed about several information and data referral services established by other collaborating agencies like WMO (INFOCLIMA), UNEP (INFOTERRA) and ICSU (CODATA). In order to ensure that the Committee is fully aware of these services and that MEDI is co-ordinated with them, descriptions of these services were presented by representatives of these international organizations.

The WMO Climate Data Information Referral System - INFOCLIMA, is being developed to meet the needs for data referral of the World Climate Programme. This referral service will prepare both a hard copy catalogue and a computer-readable data base, which would be widely distributed. The WMO Secretariat will limit its role in the preparation of the data base and will not become a service centre for requests.

The referral catalogue of data sets is the most relevant to MEDI of the four components of INFOCLIMA. Although the first priority will be the referral meteorological data sources, the breadth of the WCP mandates will cover access to marine data and other types as well.

WMO has designed a questionnaire to gather data set descriptions. Recently WMO requested IOC to comment on whether this form and the resulting information is compatible with MEDI so that information can be exchanged between the systems.

CODATA is working on a set of directories of information source in many areas of science including the geophysical sciences. These directories are intended for joint users external to a particular discipline for sources within that discipline. Directories already exist for hydrology and seismology. Work is continuing on a meteorology directory. Work on a directory for oceanography had been initiated with the active participation of IODE experts.

INFOTERRA is still operating in a compatible fashion with MEDI and INFOCLIMA. Although a major overhaul is planned for 1984, this should not affect the co-ordination with the other two services. In addition, INFOTERRA is likely to become a public data base on one or more internally accessible on-line systems within the coming year.

The Committee noted the activities of other international bodies in the field of implementation of their respective information and data referral systems and expressed an opinion that co-operation between them should be continued and improved.

5. REQUIREMENTS OF IOC SCIENCE PROGRAMMES AND OCEAN SERVICES

5.1 GLOBAL INVESTIGATION OF POLLUTION IN MARINE ENVIRONMENTAL (GIPME) AND MARINE POLLUTION MONITORING SYSTEM (MARPOLMON)

The Chairman of the Task Team on Marine Pollution Data Exchange introduced this agenda item (Doc. IOC/IODE-XI/24). In doing so, he noted that during the intersessional period the Task Team was working along the lines identified by its Terms of Reference and concentrated efforts on the following objectives: examining suitable formats for international exchange of pollution data, establishing rules for quality control, and investigating suitable ways of setting up inventories for pollution data. It was noted that the quality control of pollution data was very low, making difficult the use of these data in international studies. In this respect the Committee noted that the ICES interim format for pollution data was a serious attempt but recognized that the work should be continued in conjuction with the IOC Working Committee for GIPME.

The Committee approved the Report of the Chairman of the Task Team and recommended that the Task Team should study the question of coding of biological materials in collaboration with the Task Team on Marine Biological Data and advise the Committee bearing in mind that it should have a hierarchical structure. The Committee concurred with the idea that data at this stage should be archived at national level until format for pollution data exchange and rules of quality control have been agreed upon. The Chairman of the Group of Experts on RNODCs submitted IOC/RNODC-IV/9 "Requirements for a MARPOLMON RNODC" through the September meeting of the Group of Experts. The Committee urged the USA RNODC-MARPOLMON and the Chairman of the Group of Experts on RNODCs to utilize this document. The Committee recommended that as soon as the above-mentioned obligations are fulfilled the Secretary of IOC should make new efforts in order to find a data centre familiar with pollution data archiving and management in order to gain advice on this type of data. In this respect the Committee appreciated the statement of the Soviet Union Representative that his country would be ready to contribute to the work of RNODCs for MARPOLMON at the beginning of 1986.

The Heads of existing RNODCs dealing with pollution data in Japan and the USA reiterated the readiness of their Centres to continue their activities in the framework of responsibilities originally assigned to them.

The representative of the IOC Working Committee for GIPME provided information on its latest activities, paying special attention to the maturing of GIPME and also to the development of a detailed plan of action for the future implementation of the Comprehensive Plan for GIPME. He noted with appreciation good relations established between the Working Committee for GIPME and IODE but stressed that further actions needed to meet the requirements of the scientific community in pollution data.

The Committee welcomed the statement that GIPME is ready to provide whatever assistance needed to IODE in the development of the Task Team activities and RNODCs dealing with marine pollution.

The Committee recognized the need to study the design of an adequate inventory for pollution data in conjunction with the future Group of Experts on Marine Information Management, if established, and of revised ROSCOP forms in conjunction with the Group of Experts on Format Development.
Resolution IODE-XI.5 was adopted.

5.2 INTEGRATED GLOBAL OCEAN SERVICES SYSTEM (IGOSS)

The representative of WMO opened the discussion on the agenda item by stressing that the key element in the IGOSS data management scheme should now be the provision of climatic data sets, whereas 10 years ago the emphasis was on the operational characteristics. The requirement for climatic data places a huge extra load on the IGOSS system. It is vital that data routed via IGOSS in real time should be assimilated into climatic data sets via RNODCs and the WDCs as soon as possible.

The representative of the Joint IOC/WMO Working Committee for IGOSS informed the Committee on the latest findings and noted that the Joint Working Committee was very concerned with the procedure for delivery of data from IGOSS Data Centres to the RNODC, IGOSS of the IODE. He recommended that a meeting be organized jointly by IOC and WMO with participation of IGOSS and IODE Experts involved in the problem with a view to resolving the problem related to the continous flow of IGOSS telecommunication data from the IGOSS operational system to the IODE archiving system.

The Committee was presented with an issue paper which identified the major problem to be considered by the above proposed meeting, as the following:

In general the necessary links are in place, and functioning, and most data are being archived. However, there are technical problems and some confusion about procedures, which are delaying the availability of data. RNODC terms of reference and definition of responsibilities are about 10 years out of date, and provide little real information about services available from RNODCs. The archiving and exchange procedures are also many years old. It has been difficult to follow these procedures for a variety of reasons, partly because they do not take into account the new IGOSS products, and also because they are not based on the GF-3 Format.

Several formats are used for the archival of BATHY/TESAC Data and some of these do not provide for the quality control flags available from the IGOSS processing centres. The variety of formats makes it difficult to provide users with consistent data sets.

It was noted that within IGOSS the format for BATHY/TESAC has been developed, and is in the process of approval. This cannot now be changed, but it can be decided that GF-3 should be the format for IGOSS data within IODE. Also, new condones for new types of data sources are being added to IGOSS, and in a few years' time a much wider range of data may be flowing on the GTS.

It was also noted the proposal of the USSR that IGOSS data exchange should proceed in GF-3. The Committee welcomed the proposal from Canada for Fortran software to make available to the RNODC-Formats to convert the IGOSS Operational delivery Format into GF-3. This portable computer programme will permit the exchange of BATHY/TESAC data in GF-3 within IODE.

At present there is no method of monitoring the effectiveness of the IODE system in archiving IGOSS data.

The Committee concurred with the proposal to arrange the meeting of IGOSS and IODE experts and requested the Secretary IOC to consider the possibility of holding this meeting in 1984 in one of the Member States having RNODC-IGOSS.

The Committee agreed with ideas outlined above, decided to disband the position of Rapporteur for IGOSS and adopted Recommendation IODE-XI.3. With regard to the Manual on IGOSS Data Archiving and Exchange the Committee noted with concern that the revised draft still required further updating. It was therefore recommended that a consultant be engaged to prepare a final version of the Manual, incorporating the views of the proposed meeting of experts.

The Committee welcomed the offer made by Canada to act as an RNODC for drifting buoy data and that data would be in GF-3. The Committee urged the Canadian representative to formalize the offer in accordance with the procedures established in the Guide on RNODCs and recommended that the offer should be assessed quickly by the Group of Experts on RNODCs.

5.3 OCEAN SCIENCE IN RELATION TO LIVING RESOURCES (OSLR)

The Assistant Secretary of IOC introduced this item and provided the Committee with the background information on the IOC Programme on Ocean Sciences in Relation to Living Resources (OSLR). This programme was formally adopted as an IOC long-term programme on marine research by the Twelfth Assembly of IOC in 1982. A central aim within this programme should be to promote co-ordinated regional research projects aimed at elucidating the factors (physical, chemical and biological) determining the recruitment of fish populations, having regard to variability of commercial fish stock. This was called the International Recruitment Programme (IREP). The Assembly established a Guiding Group of Experts for OSLR with the Terms of Reference which stressed, inter alia, the necessity to liaise with IOC subsidiary bodies like the Working Committee on IODE that might be able to assist in one or other of the aspects of OSLR Programmes.

The Workshop on the future of the IREP component was held in September 1983 which formulated a set of objectives and strategy for practical research prospects. However, no specific decisions relevant to the IODE activities were formulated. The representative of FAO reiterated the readiness of his organization to co-operate with IOC in the development and implementation of the programme.

The Committee noted the information provided and recommended the Chairman of the Task Team on Marine Biological Data to establish closer liaison with the Guiding Group of Experts for OSLR with a view to report to the Chairman of the Committee on new findings in the development of this programme. The Committee agreed that in future there may be a necessity to broaden the scope of co-operation with the scientific community involved in the OSLR Programme.

5.4 OCEAN SCIENCE IN RELATION TO NON-LIVING RESOURCES (OSNLR)

The Chairman of the Task Team on Data and Non-Living Resources introduced his project (Doc. IOC/IODE-XI/25) by noting that the data base on Marine Cores and Dredges now contains over 50,000 entries, and is being regularly used. The data base on marine geophysical data, GEODAS, now contains 15 million digital records from 2,140 cruises and 28 institutions worldwide. Work is progressing on an on-line data base and bibliography for marine minerals worldwide, including manganese nodules, phosphorites and polymetallic sulphide data. Computer translation routines are being developed to translate between GF-3, MGD-77, and the Core Curator's Formats, and the parallel existence of these formats is not a serious problem. Through close co-operation with Task Team members, the MGD-77 format now exists in Russian, Japanese, French and English.

Format developments include the introduction of the commercial data base management system, System 2000 at WDC-A MGG, the introduction of the format SEISNAV, similar to MGD-77, for the exchange of navigational data related to seismic profiling data, plans for an exchange format for Engineering Properties of Marine Sediments, and a system for the retrieval of well log data.

A substantial quantity of Japanese seismic profiling data has been transferred to WDC-A MGG, co-operation continues on SEA BEAM data with France and oceanic marine geophysical data is being obtained from UK and the Peoples' Republic of China. The Chairman stated further that exchanges are unfortunately more expensive than is desirable, and this can cause problems with developing countries. Familiarity between personnel and with inventories and successful previous use of formats, all contribute to efficient international exchanges. It was stressed that inventory exchantes may be a valuable prelude to data exchange.

The Committee noted that the IG/GCI forms are no longer being used and recommended that they be discarded. The Committee further noted that the formation of the Task Team had coincided with the establishment of the new WDC-A for Marine Geology and Geophysics at Boulder, Colorado and realized that development and activities of WDC-A MGG require a revision of the published procedures for data exchange, and the Task Team was requested to contribute effort to the necessary revision of the Manuals.

The UN/OETB representative drew the attention of the Committee to the OSNLR programme, announced the co-sponsorship (IOC-UN/OETB) of the OSNLR Programme and strongly encouraged the continuation of the work of the OSNLR Task Team. The Committee appreciated the statement of the UN/OETB representative that it will continue to meet its obligations to Member States in the provision of minerals data and in the interpretation and evaluation of such data.

The Committee was informed of the long-term involvement of France in SEA BEAM activities including collection, processing and co-operation in the development of exchange formats. Additionally, the Committee noted the activities of the Task Team in SEA BEAM exchange format development in consultation with the Group of Experts on Format Development. A draft format was tested at sea in late 1983 and the results of that test are now being circulated for comment.

The Committee approved the report of the Chairman of the Task Team and adopted Resolution IODE-XI.6.

Report of WDC-A MGG

The Director of WDC-A MGG presented a report on the activities of the Centre, and stressed its close co-operation with the Task Team. He informed the Committee that the Centre operates in close relation with the WDCs for Solar Terrestrial data, Solid Earth and Claciology. A great deal of work is devoted to supporting software, graphics, merge packages, coastline plotting routines, etc. Close co-operation will be continued with WDC-A Oceanography. Significant data sets had been obtained from the People's Republic of China and from France. There was discussion concerning the availability of marine geological data on the IODE system, and the apparent low rate of exchange of such data. Several countries pointed out that responsibilities for byathmetric data and continental shelf geological data were sometime divided between geological insitutes, hydrographic departments and oceanographic institutes, so that a single focal point did not exist for communication with the IODE system.

Activities of the Joint IOC/IHO Guiding Committee for GEBCO

Under the same agenda item new developments in the activities of the Joint IOC/IHO Guiding Committee for GEBCO were highlighted.

The representative of GEBCO noted that the Guiding Committee for GEBCO at its Ninth Session decided to ensure the co-ordinated flow of bathymetric data from the two main traditional sources - the scientific community and the hydrographic community. There was a need to develop a cross fertilization between the different approaches of these two communities and for this purpose the Guiding Committee had established a Sub-Committee on the Exchange of Digital Data. The Working Committee was invited to participate in the activities of the Sub-Committee. The Committee was informed that the third edition of the Echo-Sounding Correction Tables has been published by the UK Hydrographic Department, the UK NODC can now provide the tables on tape, and supporting software. The Sub-Committee on Digital Bathymetry will review existing or planned digitization of bathymetric contours, and a questionnaire has been prepared.

The Committee took into account this information and recommended the establishment of close contacts with the Sub-Committee on the Exchange of Digital Data.

5.5 OCEANOGRAPHIC COMPONENTS OF THE WORLD CLIMATE RESEARCH PROGRAMME (WCRP)

The Chairman highlighted the activities of the Task Team during the inter-sessional period and introduced document IOC/IODE-XI/26. This document was prepared as a paper outlining data management assistance that could be provided in the World Climate Research Programme. Due to the fact that it was early yet in the WCRP-Oceanography (WCRP-O) to be developing detailed data management plans, known WCRP-O data needs were analyzed and the ways suggested for assisting the IOC/IODE in the development of WCRP-O.

The Committee realized that the timeliness of data transmission to users is of high importance both to the research programmes (WOCE and TOGA) and the ocean observational system. New data needs will emerge with the new series of earth observing satellites dues in the latter part of the decade and ocean models will need gridded data sets where possible. Inventories will be of high importance and the initiative of the Working Committee on IODE in Marine Information Management will be of great help. RNODCs specialized in serving WCRP-O needs have a great potential.

The observer from the Joint IOC/SCOR CCCO reiterated CCCO's wish, whenever possible, to use the IOC systems in developing the data management system of WCRP-O. To assist the process the CCCO intends to set up a group of experts from TOGA, WOCE, IODE, IGOSS and the satellite community. It will be chaired by Professor K. Voigt who is a member of CCCO and a Vice-Chairman of IOC. Concluding, the observer identified timeliness, quality control, data products and completeness of the data sets as key considerations.

The Committee welcomed the initiative of CCCO in establishing the data management group and urged its Chairman to participate closely with IODE by selecting a suitable candidate to represent it.

The WMO representative and delegates stressed the importance of a catalogue of long oceanographic time series for climate studies.

The Committee reviewed the decision of its Tenth Session relevant to the revision of the IOC Manuals and Guides no: 2 and recommended that this publication be not updated but that a new manual on long oceanographic time series be developed. The Committee agreed that this manual would be in two parts: Part 1 to be a catalogue of carefully selected data sets; Part 2 to be a comprehensive but less detailed list of as many such time series are known to be available. In both parts, a time series would not be included unless extending over a period of at least a decade. The Catalogue should include long series of SST measurements made at coastal stations.

The Committee recommended that a Task Team on Ocean Data Management for climatic studies be re-established with revised terms of reference and in that regard adopted Resolution IODE-XI.7.

The Committee emphasized the importance of meetings such as the Consultative Meeting on Climatic Oceanographic Data (August/September 1983, Hamburg) and concluded that another meeting should be arranged in consultation with the Secretariat IOC during the next intersessional period. The Committee requested the Secretary IOC to invite WMO and SCOR representatives to participate.

The Director of RNODC-FOY summarized the intersessional work of the Centre. He further proposed that the Centre will terminate acquisition of data sets as at 30 June 1984 and that the data sets be distributed by September 1984 to WDC-A which will provide a copy to WDC-B. If this is the case, RNODC-FOY will cease to exist at that time.

The Secretary IOC was requested to send a letter to organizations in Member States who volunteered to be donors of data sets collected in the FOY urging them to complete submission of sets to RNODC (FOY) for inclusion in the final data base.

The Committee extended its thanks to all Member States that participated in the development and operation of RNODC-FOY.

6. REQUIREMENTS OF IOC REGIONAL SUBSIDIARY BODIES AND EXPERIMENTS

6.1 IOC SUB-COMMISSION FOR THE CARIBBEAN AND ADJACENT REGIONS (IOCARIBE)

Referring to the recommendations of the IOC Sub-Commission for the Caribbean and Adjacent Regions relevant to data and information management, the Committee noted that the Working Committee on IOC was requested to provide training and assistance in data management and in the operation of oceanographic data centres. To meet the first need an RNODC for IOCARIBE was established in the United States. A second area of need was identified as being to develop a regional system for information dissemination by strengthening and using existing centres and services.

The Director of the RNODC for IOCARIBE reported on two problems encountered by the centre. First, data are submitted at a slow rate. Second, it is not always clear whether data received are intended to become part of the RNODC for IOCARIBE or as part of RNODC for MARPOLMON. It is not practical to store a data set in more than one place.

Regarding training, plans are under way through GIPME for training individuals from the Caribbean region at RNODC for IOCARIBE in oceanographic data management. This will help to meet the requirements of IOCARIBE as well.

The FAO representative reported that the ASFIS centre in Mexico had been designated by the Latin American Inland Fisheries Commission to be a regional centre for inland fisheries. It could extend its focus to marine information. A meeting had been held on marine information in San José, Costa Rica, in 1982 to stimulate informal co-operation with the Caribbean region, but progress has been slow, owing to the lack of resources and of effective agreement among the countries in the region to co-operate and share resources.

The Committee decided that the new Group of Experts on Marine Information Management, if established, should take the requirements for improved information services for the IOCARIBE region under its consideration.

Taking into account the report of the Director of World Data Centre B that no data had been received from the IOCARIBE Region, the Committee suggested that for improvement of data exchange all countries involved in IOCARIBE activity should submit information annually to the IOC Secretariat on planned research in order to further inform Member States through IOCARIBE Information Bulletins, and recommended that abbriged reports on research results and publications are to be distributed via the IOC Secretariat by national co-ordinators on IOCARIBE.

6.2 IOC PROGRAMME GROUP FOR THE WESTERN PACIFIC (WESTPAC)

The sessions of the IOC Programme Group for the Western Pacific stressed that data and information should be exchanged regularly and recognized the need to strengthen data and information services in Member States and to develop a common information service for the region.

The Director of RNODC WESTPAC described the progress of the Centre. He reported on the publication and distribution of the Guide to Data Management in WESTPAC and RNODC WESTPAC Newsletters No: 1 and 2. The Guide encouraged Member States to submit the results obtained from WESTPAC data to the RNODC by using existing rules and procedures of the IOC Manuals and Guides No: 9 on International Oceanographic Data Exchange. The Newsletter lists DNP/NOPs, ROSCOPs received as well as general information about oceanographic activities in the region.

The Committee met with appreciation the letter from the Chairman of the Programme Group by which he expressed his sincere thanks for the contribution of the RNODC-WESTPAC to the success of the programme.

The Committee supported the decision of the Third Session of the Programme Group pursuant to its activities and recommended that the available information services of the IOC, such as ASFIS and MEDI be used to the full to avoid unnecessary duplication that might arise from the development of ASTINFO-UNESCO regional scientific and technical information network in Asia.

The Committee welcomed information on the steps being taken by the Soviet Union to improve exchange of data related to the WESTPAC region and that France had designated a person to be responsible for the dissemination of oceanographic information in the region.

The Committee noted with concern that neither the RNODC-WESTPAC nor WDC-B receive all data being collected through WESTPAC and concurred with the request of the Programme Group that RNODC-WESTPAC consider ways to improve the transfer of data from scientists to the RNODC-WESTPAC and WDC-B.

The UNEP representative informed the Committee of the activities in the region within its Regional Seas Programme which include oceanographic research and the study of oil pollutants. The Committee invited UNEP to participate actively in the international data exchange and recommended the use of existing IODE mechanisms to facilitate flow of data and the wide dissemination of data to the scientific community.

6.3 IOC PROGRAMME GROUP FOR THE CO-OPERATIVE INVESTIGATION IN THE NORTH AND CENTRAL WESTERN INDIAN OCEAN (IOCINCWIO)

The First Session of the IOC Programme Group stressed the need for data management with emphasis on sea level data which are one of the prime variables in understanding short and long-term climatic change and dynamics of the ocean. The First Session also called for the development of an infrastructure for documentation and information exchange for the area.

The Committee was informed on the developments in the data and information system in the region and about such activities arranged in the framework of IODE, as the Training Course on sea level Data Management (PSML, UK) and the development of the IOC sea level project. The implementation of this project in the region will start this year. It was reported that the UNESCO Programme for General Information had funded a project to modernize the facilities of the National Institute of Oceanography at Goa, India.

The representative of UNEP drew the attention of the Committee to the activities of the Programme adjacent to IOCINCWIO regions such as the Red Sea and Persian Gulf and highlighted the difficulties the programme possesses in the carrying out of investigations. The Committee noted that much should be done to improve national facilities by establishing NODCs and creating data banks for the region. The Committee welcomed the offer made by the delegate of Norway to provide assistance in oceanographic data processing and information from the research undertaken by a Norwegian vessel in the region.

6.4 IOC PROGRAMME GROUP FOR THE SOUTHERN OCEANS (SOC)

The Committee received information from the Chairman of the Meeting of the SOC Ad hoc Task Team on Data Management on the deliberations connected with the need and terms of reference for an RNODC(s) in the region. Noting that all data used by any RNODC are available in the WDCs - A and B Oceanography, the Task Team agreed that any scientific programme in the region would benefit from the specialized services of RNODC(s). The Task Team would now move to the task of identifying the data management services and products needed to support oceanographic programmes in the SOC region. This information would be used to develop sample "terms of reference" for any future centre(s).

Noting Argentina's long standing offer to operate an RNODC in the SOC region, the delegate of Argentina stressed the urgency of developing sample "terms of reference" for RNODC(s) for physical and chemical oceanographic data in the SOC region. The Committee strongly urges the Task Team to complete its work prior to the next meeting of the Group of Experts on RNODCs now scheduled for October or December 1984.

The Committee requested its Chairman and the Chairman of the Group of Experts on RNODC(s) to follow closely all findings of the SOC Programme Group and its subsidiary bodies in this matter. The Committee addressed the Chairman of the Programme Group to give high priority to the development of Terms of Reference of future RNODC(s) for physical and chemical oceanographic data.

6.5 MEDITERRANEAN ALPINE EXPERIMENT (MEDALPEX)

The Assistant Secretary IOC gave background information on the objectives and the status of implementation of MEDALPEX. He reminded the Committee that two RNODCs were identified to support the data management plan for MEDALPEX - one dealing with conventional oceanographic data (RNODC-MEDALPEX) and the other with sea-level data under the auspices of PSMSL.

The Director of RNODC-MEDALPEX reported that his centre is completing a catalogue of data received. About one mission observations from 13 ships and 28 fixed stations are expected to be included in the data set. He also reported that the final processing of data from Co-operative Investigations of the Mediterranean (CIM) Programme will require approximately one and a half years more.

The delegate of the United Kingdom speaking on behalf of PSMSL reported that the centre is currently screening data and documentation from 26 of the 36 sea level sites. Sea level data will be converted to the GF-3 format and sent to the World Data Centres by the end of 1984.

The Committee welcomed the activities of Centres and urged Member States to fulfill their commitment to send outstanding data to RNODC-MEDALPEX and PSMSL as soon as possible.

6.6 JOINT IOC/WMO/CPPS WORKING GROUP ON THE INVESTIGATIONS OF "EL NINO"

The Committee was informed on the Recommendations of the Groups of Experts on RNODCs and the Third Session of the Joint IOC/WMO/CPPS Working Group to examine the data processing and exchange needs of the region by undertaking a mission in the countries of the region by a specialist in data and information management and a representative of the Secretariat. The mission should prepare a report which will include a scientific justification for an RNODC or RNODCs in the region and a technical justification which should approve the recommendation of the mission to establish a centre or centres in the specific country or countries. The Committee also noted the decision of the Third Session of the Joint IOC/WMO Working Committee for IGOSS to organize a mission to South American countries to identify the needs for an interest in IGOSS data and products, to explore and develop more fully national IGOSS programmes.

The representative of Colombia and Chile stressed the importance of a joint IOC/IGOSS mission to the region due to the fact that in "El Nino" countries some experts and officials are responsible for both programmes;

The Committee concurred with this recommendation and bearing in mind that a joint mission will also save money, recommended the Secretary IOC to take all necessary steps for a joint mission to be implemented in the first half of 1984.

7. FUTURE ROLE OF MARINE INFORMATION MANAGEMENT WITHIN THE IODE SYSTEM

The background of IOC's concern with the problems of information management was reviewed by the Acting Chairman of the Joint FAO/IOC/UN-OETB Panel of Experts on ASFIS.

By 1980 it became apparent that siginificant effort would be required to ensure that the benefits of marine information use would be shared equitably by the developing countries. It was observed that the need for information management and delivery usually precedes the need for data management in the developing countries. More recently, the United Nations Convention on the Law of the Sea has stressed the need to make information about the marine environment and resources available freely.

Consequently, it became apparent that a carefully conceived programme for marine information management should be developed to go beyond the advances already made through ASFIS and MEDI. Such a programme would have to show how the needs for information products, services, and institutions could be met for the remainder of the twentieth century or longer. A balanced plan would aid in locating and allocating resources to information management, including training and infrastructure development throughout the spectrum of information from research to application.

The Chairman of the Task Team on IODE's Role in Information Management then reviewed the proposal for action prepared by the Task Team (Doc. IOC/IODE-XI/28). The plan has four components that were organized into three scenarios or stages of development in recognition that budgetary restraints and prudence dictate carefully ordered steps. The Task Team called for:

- Filling an existing position at the IOC Secretariat that has duties relevant to information and data management;
- Establishing a new IODE Group of Experts on Marine Information Programmes to strengthen and consolidate the responsibilities now assigned to the Task Team on Marine Information Management, the Group of Experts on MEDI, and the Joint Panel of Experts on ASFIS;
- Engaging a consultant, using extrabudgetary funds to produce a programme development plan for Marine Information Management under the guidance and review of the Group of Experts;
- Seeking extrabudgetary funds and associate experts from donor agencies and member countries to begin the implementation of activities to be described in the programme development plan.

The Committee agreed that the recommended programme development plan will provide a clear picture of the full, world-wide scale and priorities for development. A draft outline for the plan was developed at the ad hoc Informal Meeting on Future ASFIS Development and Support. The advantages of such a plan are to permit efficient, phased activities and to lend credibility to international agencies in seeking resources to implement portions of the plan once it is established.

Regarding the future of ASFIS, the Chairman of the Joint Panel of Experts explained that the scope of ASFIS goes beyond the mission of IOC, as it includes the fresh water environment as well as marine. A new structure for the governance of ASFIS will be proposed in the programme development plan and IOC's role as the spokesman for marine information will be a part ot this proposal.

The draft outline for this plan, previously developed at the ad hoc Informal Planning Meeting on Future ASFIS Development and Support (IOC/INF-537) is shown in Annex IV to this report.

Regarding MEDI, the Chairman of the Group of Experts on MEDI endorsed the Task Team's proposal, pointing out that MEDI would be part of the responsibility of the new Group of Experts. The Committee called attention to the fact that many countries have devoted considerable effort to developing scientific and technical information systems, including marine information. IOC should attempt to use information from these systems and to learn from their experience. Likewise, the experience of IODE in the exchange of data should be considered when designing information systems.

Although the Committee generally concurred with the idea that IODE should expand its programmes to respond to needs for improved information flow, there were, as in previous years, concerns expressed that the already limited resources for data-related activities would be diluted by this new departure.

In response to these concerns it was noted that for the activities of the newly established Group no funds were being requested beyond those already allocated to MEDI and ASFIS. The Committee recommended to the Secretary IOC new resources should be sought from non-IODE budget sources.

The representative of UNEP welcomed the proposal of the Task Team, remarking that it will be important to ensure that the proposed panel contains all of the required expertise for such a broad scope. He also spoke of the need to establish an inter-agency panel on marine information. UNEP will study the ways of providing resources for the support of marine information programmes in the future.

The Task Team Chairman reminded the delegates that several international agencies produce and use marine information in their programmes. IOC should endeavour to co-ordinate these information-related activities for the benefit of users of this information. The proposed plan would give a firm basis for any coordinating action.

The Committee was informed further on the status of the preparation of the Handbook on Marine Scientific and Technical Information as it was requested at its Tenth Session. The Committee appreciated the grant to the IOC Trust Fund by the International Development Research Centre (IDRC), Canada to engage a consultant to carry out the preparation of the Handbook and to cover the costs of publication.

The representative of IDRC reviewed the functions of his organization. IDRC provides "seed money" to projects designed to improve the information management capabilities of developing countries. Among the donor agencies, it is unique in having a programme dedicated to the support of information science activities.

The IDRC representative strongly supported the programme outlined by the Task Team Chairman. He noted in particular that having a well-conceived long-term plan is a sine qua non for the development of an information programme and indeed that donor agencies generally do not give serious consideration to the funding of projects in the absence of such a plan. It is important for project proposals to show how co-ordination with related national and regional projects takes place so that individual proposals for funding can be related to worldwide needs and priorities.

The Committee urged the Secretary of IOC to encourage subsidiary bodies of the Commission, Member States of the IOC as well as regional and international marine science institutions and organizations to contribute relevant information to the consultant who will be contracted to prepare the Handbook, for inclusion in the Handbook. It was proposed that the International Marine Science Newsletter be used to facilitate the preparation of the Handbook.

The Committee welcomed the offer of FAO to host the first meeting of the Group of Experts in Marine Information Programmes in Rome in October 1984.

The Committee approved the Report of the Task Team on ICDE's Role in Marine Information Management and adopted Recommendation IODE-XI.4.

8. PUBLICATIONS

The publications of IODE were discussed by the Committee, with reference to other agenda items where the technical details of the contents of publications were defined.

(i) IODE Handbook

The Chairman of the Working Committee on IODE reported that the IODE Handbook had become a valuable working took for intersessional communications, and that it was important that it should be published swiftly after each session, so that the information could be available to all Member States throughout the intersessional period. The Committee supported the publication of the Handbook and urged IODE National Co-ordinators to submit the necessary information for a new version to the IOC Secretariat as early as possible.

The Committee appreciated efforts made by the IOC Secretariat for the publication of the Handbook.

(ii) Manual on International Oceanographic Data Exchange (IOC Manuals and Guides No. 9)

The Committee accepted the draft version of the Manual and Guides No. 9 with the provision that some additional changes may be necessary in accordance with standard editorial practice and requested that final amendments to the draft text of Manuals and Guides No. 9 should be submitted to the Director of WDC-A by mid-February.

The Director of WDC-A reported upon the progress of IOC Manuals and Guides No. 9 and noted that modifications are necessary in the diagram showing the flow of data, and further information is due from the Task Teams on DNP/NOPs and Non-Living Resources. Recommendations will be included on the types of data which should be exchanged routinely as standard data types, and those which may be exchanged as special data. Close consultation will be required with ICSU, since there are differences in style between the IODE Manual and the proposed ICSU Guide.

The Committee noted that the terms of reference of the WDCs permitted charges to be made for special services provided, and additionally noted that in future as at present, no charges would be required for services with regard to transfer of data between WDC-A and WDC-B.

(iii) Popular Illustrated Brochure on the IODE System

Recommendation IODE-X/8 proposed that there should be a popular brochure on the IODE System. This should explain the services provided by the IODE system, and the advantage to Member States. It should be of attractive design, and should provide information to non-technical planners and administrators in both developing and developed countries. The Committee agreed that it was essential to have the brochure produced before the twenty-fifth anniversary of the IOC Assembly early in 1985.

(iv) IODE Posters

The Committee approved the production of posters to promote the IODE system which should also be available before January 1985. The posters will be produced jointly by the USA and USSR. The Committee noted information on the preparation of posters on the structure of the ICSU WDC system and recommended this poster should be used at the coming IOC Assembly.

The Committee further noted that IOC was involved co-operatively in the production of ASFIS and ASFA publications, and ASFIS related training literature and computer system products. A new ASFIS Thesaurus is in production, and this will expand greatly the range of terminology defined for the marine sciences. It could be used as the basis for a glossary of terms. During 1984, ASFA will include about 30,000 references and abstracts.

9. CO-OPERATION WITH INTERNATIONAL ORGANIZATIONS AND OTHER BODIES ON OCEAN DATA AND INFORMATION

The Chairman of the IOC Working Committee on IODE presented the views of the representatives of international bodies attending the Eleventh Session of the IOC Working Committee who met prior to the session at the invitation of IOC, and reviewed the existing mechanisms for co-operation and the need for improvement in the future.

In order to avoid duplication of effort, to design common methodologies and to provide the best service to Member States in the use and dissemination of data, the international organizations concerned with the marine environment have for many years collaborated in data activities.

Within recent years, a number of interdisciplinary programmes of global scope have emphasized the need for a close collaboration in the standardization of methodologies and formats and the improvements of data inventories.

The Working Committee for International Oceanographic Data Exchange has become per se a major forum for the interaction of those responsible for marine data and information activities at the national level with their opposite numbers in the United Nations agencies and other organizations. The discussions and decisions of the Working Committee and its subsidiary groups have an impact, not only on activities of IOC, but also on activities of FAO, UNEP, UNESCO, WMO and of a number of other international bodies. These considerations have, at times, hampered the Working Committee since it has been called upon to discuss activities relevant to many organizations but could only make recommendations to one, the IOC.

The Committee appreciated the view of the representatives of international organizations on the role the Committee plays in international oceanographic information and data exchange and requested the Secretary IOC to discuss this matter with United Nations (OETB), FAO, UNEP, UNESCO, IOC and WMO with the object of defining methodologies by which those recommendations of IODE which are relevant to the marine data and information activities of these organizations can be transmitted promptly to the appropriate bodies for consideration as requests for action emanating from and intergovernmental committee.

The Committee concurred with the principles identified by the inter-agency consultation which should be borne in mind in the operation and further development of oceanographic data and information activities:

- Collaborate in sharing information regarding plans for data activities so as to avoid unnecessary duplication of effort and to make activities in data management complementary;

- Make maximum use of existing mechanisms for data exchange and archiving such as the International Oceanographic Data Exchange system and the World Data System;

- Assist in informing Governments of these mechanisms and advise those Governments of the advantages of providing data to those systems;

- Co-operate in ensuring effectiveness and comprehensiveness of international data referral services such as MEDI, INFOCLIMA and the CODATA Directories;

- Promote the better use of existing information systems such as ASFIS.

10. IODE GENERAL PLAN OF ACTION AND IMPLEMENTATION PROGRAMME FOR THE NEXT INTERSESSIONAL PERIOD

The Committee received and adopted the draft of the IODE Plan of Action and Implementation Programme for the next intersessional period after careful discussion and amendments by the meeting.

The Committee urged the Chairman and the Vice-Chairman of the Working Committee on IODE to make a detailed review of the Summary Report and Resolutions and Recommendations adopted at the Eleventh Session and to make the Action Plan consistent with the actions proposed for the future activities of the Committee. After the Action Plan has been made final the Secretariat of IOC will distribute it for follow-up according to the procedures established.

The Committee noted the statement made by the delegate of the USA which is given below. "The United States recognizes the need for new and improved programmes within the IOC and the Working Committee on IODE. However, it must also be recognized by all Member States that continued and unrestrained budget growth is unrealistic. The US therefore urges the IOC Secretariat to make every possible effort to take advantage of such mechanisms as elimination of marginal programmes and the reduction of programmes which might be of lower priority in addition to other initiatives which the Secretary might develop to achieve cost reductions which off-set the cost increases that might result from recommendations coming from this meeting." The delegate of the USA restated that the United States looks forward to continued participation in the work of the IOC and, in particular, of its Working Committee on IODE".

11. IODE ACTIVITIES IN TRAINING IN MARINE INFORMATION AND DATA MANAGEMENT

The Committee noted the proposal made by the Chairman of the Working Committee relevant to a new approach for the TEMA component of IODE and agreed that the concept of a TEMA Co-ordinator within the IODE Committee be discontinued.

The Committee appreciated the close collaboration established with the IOC Working Committee for TEMA and expressed thanks to the staff of the TEMA Unit of IOC for assistance in the successful implementation of training activities under the auspices of the Working Committee on IODE. The Committee thanked the delegates of Japan, France, UK and USA for their generous efforts in arranging training for specialists from developing countries in different fields of data management.

The Committee noted information on the meeting of Heads of NODCs from South America, supported its Recommendations and recommended the Secretary of IOC to continue the holding of such sessions. The Committee welcomed proposals made by Argentina and China to arrange training courses in data management and products preparation in their countries in 1984 and called upon the Secretary of IOC to follow up this offer.

The Committee agreed that training of marine information and data specialists is one of the most important parts of the development of the needed infrastructure in developing countries. It further concluded that training courses should take place in the developing countries whenever possible.

The Committee expressed a strong belief that the potential effectiveness of the Committee can only be realized if all Member States participate fully in its programmes. However, participation by developing countries is restricted.

The Committee noted that the calls for assistance from several IOC regional bodies provide evidence that the need for information access and management precedes the need for more sophisticated data management training. The Committee agreed that the situation of each region and country needs to be considered separately, depending on the level of development of its marine science information, data and research programmes.

Noting that it is difficult to develop training programmes because the specific needs of developing countries are seldom clearly identified by representatives of these countries, the Committee concluded that a Task Team including members from developing countries would be useful in order to:

- be a contact point for identifying training needs
- provide a focal point for expertise in training programmes
- help other IOC working groups and consultants to be aware of training needs and problems.

It was decided that the Task Team comprise the IODE Vice Chairman as the Task Team Chairman and members to be nominated by the Member States and selected in accordance with established IOC rules and procedures.

It was futher decided that future members of the Task Team should reflect representation by geographic areas so as to ascertain information regarding training needs of their respective regions and to communicate these needs to the Task Team Chairman. Close contacts should be established with IOC regional offices and their knowledge, experience and contacts in the region should be actively exploited. In this respect the Committee adopted Resolution IODE-XI.8.

12. ADOPTION OF THE SUMMARY REPORT

The Committee adopted the Summary Report, Resolutions and Recommendations and requested the Chairman to endorse the final edited version to be prepared by the IOC Secretariat.

13. DATE AND PLACE OF NEXT SESSION

With a view to more adequately address and complete the intersessional work, particularly the tasks assigned to the Sub-Groups of Experts and the Task Teams, the Committee was in favour of extending the interval between the regular sessions of the Working Committee and decided to have the Twelfth Session of the Committee some time during the second half of 1986. The Committee requested the Chairman to fix exact dates in consultation with the IOC Secretariat.

If there was no invitation by a Member State before the end of 1985 to host the next session, the Committee decided to hold the Twelfth Session of the Committee in Paris, at UNESCO Headquarters.

14. CLOSURE

The Chairman thanked the participants for their generous efforts of co-operation which had made the session so successful and further extended his thanks to the United Nations and particularly the United Nations Ocean Economics and Technical Branch (UN(OETB) for the excellent facilities provided.

The Committee expressed its high regard for the hard work of the Secretariat and the Rapporteurs and especially that of the Chairman of the Working Committee on IODE for conduct and the Assistant Secretary for the preparation of the session and thanked the interpreters and supporting staff for their spirit of collaboration the conduct of the session.

The Chairman then closed the Eleventh Session of the Working Committee on International Oceanographic Data Exchange at 16.30 hrs. on 18 January 1984.

ANNEX 1

AGENDA

1.	OPENING OF THE SESSION
2.	ADMINISTRATIVE ARRANGEMENTS
2.1	ADOPTION OF THE AGENDA
2.2	DESIGNATION OF THE RAPPORTEURS
3.	WORK ACCOMPLISHED DURING THE INTERSESSIONAL PERIOD
4.	DEVELOPMENT OF IODE COMPONENTS
4.1	RESPONSIBLE NATIONAL OCEANOGRAPHIC DATA CENTRES (RNODC)
4.2	FORMAT DEVELOPMENT
4.3	EXCHANGE OF AIR3ORNE AND SATELLITE REMOTELY SENSED OCEANOGRAPHIC DATA
4.4	MARINE BIOLOGICAL DATA
4.5	STANDARD CRITERIA FOR PHYSICAL OCEANOGRAPHIC DATA
4.6	MEASURED WAVE DATA MANAGEMENT
4.7	DEVELOPMENT OF IODE DATA CENTRE SERVICES
4.8	ANNOUNCEMENTS OF DECLARED NATIONAL PROGRAMMES/NATIONAL OCEANOGRAPHIC PROGRAMMES (DNP/NOP)
4.9	MARINE ENVIRONMENTAL DATA INFORMATION REFERRAL SYSTEM (MEDI)
5.	REQUIREMENTS OF IOC SCIENCE PROGRAMMES AND OCEAN SERVICES
5.1	GLOBAL INVESTIGATION OF POLLUTION IN MARINE ENVIRONMENTAL (GIPME) AND MARINE POLLUTION MONITORING SYSTEM (MARPOLMON)
5.2	INTEGRATED GLOBAL OCEAN SERVICES SYSTEM (IGOSS)
5.3	OCEAN SCIENCE IN RELATION TO LIVING RESOURCES (OSLR)
5.4	OCEAN SCIENCE IN RELATION TO NON-LIVING RESOURCES (OSNLR)
5.5	OCEANOGRAPHIC COMPONENTS OF THE WORLD CLIMATE RESEARCH PROGRAMME (WCRP)
6.	REQUIREMENTS OF IOC REGIONAL SUBSIDIARY BODIES AND EXPERIMENTS
6.1	IOC SUB-COMMISSION FOR THE CARIBBEAN AND ADJACENT REGIONS (IOCARIBE)
6.2	IOC PROGRAMME GROUP FOR THE WESTERN PACIFIC (WESTPAC)
6.3	IOC PROGRAMME GROUP FOR THE CO-OPERATIVE INVESTIGATION IN THE NORTH AND CENTRAL WESTERN INDIAN OCEAN (IOCINCWIO)
6.4	IOC PROGRAMME GROUP FOR THE SOUTHERN OCEANS (SOC)
6.5	MEDITERRANEAN ALPINE EXPERIMENT (MEDALPEX)
6.6	JOINT IOC/WMO/CPPS WORKING GROUP ON THE INVESTIGATIONS OF "EL NINO"
7.	FUTURE ROLE OF MARINE INFORMATION MANAGEMENT WITHIN THE IODE SYSTEM
8.	PUBLICATIONS
9.	CO-OPERATION WITH INTERNATIONAL ORGANIZATIONS AND OTHER BODIES ON OCEAN DATA AND INFORMATION

10. IODE GENERAL PLAN OF ACTION AND IMPLEMENTATION PROGRAMME FOR THE NEXT INTERSESSIONAL PERIOD

11. IODE ACTIVITIES IN TRAINING IN MARINE INFORMATION AND DATA MANAGEMENT

12. ADOPTION OF THE SUMMARY REPORT

13. DATE AND PLACE OF NEXT SESSION

14. CLOSURE

ANNEX II

RESOLUTION IODE-XI.1

EXCHANGE OF MARINE BIOLOGICAL DATA

The Working Committee on International Oceanographic Data Exchange,

Having considered the report of the Task Team on Marine Biological Data and its recommendations,

Noting the widespread and growing interest in enhancing the exchange of biological data,

Recognizing the diversity and complexity of marine biological data in general,

Confirming that GF-3 is a potential vehicle for the exchange of alphanumeric marine biological data,

Realizing that more specific guidelines and mechanisms could enhance the modest exchange of these kinds of data,

Foreseeing the need to improve the flow of marine biological data from the scientist into the IODE System,

Requests NODC's, RNODC's and similar organizations, in co-operation with appropriate national bodies, to promote, within their national oceanographic communities, the archiving and exchange of marine biological data through WDC (Oceanography) System,

Decides to renew the "Task Team on Marine Biological Data" with modified Terms of Reference to:

- further investigate the general need for the international exchange of marine biological data and information;
- identify significant marine biological data sets to be forwarded to the Group of Experts on Format Development to be converted to GF-3 format as test data sets, to demonstrate the ability of GF-3 to handle diverse biological data;
- develop more specific guidelines for the recording, documenting and exchange of marine biological data for eventual incorporation in IOC Manuals and Guides 9; and consider mechanisms (including Groups of Experts, RNODC's, etc.) which could be established to facilitate the international exchange of biological data;
- study the various biological taxonomic coding schemes currently in use nationally, internationally or regionally, with a view to recommending on their suitability for IODE;

- act as the focal point of the Working Committee on IODE for matters relating to marine biological data management, working in close co-operation with appropriate intergovernmental and non-intergovernmental bodies and programmes (such as OSLR, BIOMASS, IABO, the Baltic Monitoring Programme, etc.);

- design promotional material explaining the merits of archiving and exchanging marine biological data.

RESOLUTION IODE-XI.2

WAVE DATA MANAGEMENT

The Working Committee on International Oceanographic Data Exchange,

Noting the report of the Task Team on Wave Data Management,

Recognizing the continuing requirements for the engineering community and the exchange of measured and hindcast wave data,

Being aware of the WMO/CMM wave programme for advice and support of the IOC Working Committee on IODE in the implementation of this programme,

Recognizing further the need to expand and improve the present wave data exchange mechanisms and procedures to accommodate even more complex data,

Taking into account the requirements of end users to have available standard data products and presentations in addition or in place of digital data,

Decides to continue the "Task Team on Wave Data Management" for the next intersessional period with the following revised Terms of Reference:

- Finalize and distribute through the RNODC Formats the "User Guide for the Exchange of Measured Wave Data";

- Complete the development and documentation of GF-3 standard subsets for wave directional spectral data and for data digitized from synoptic wave charts;

- Continue to provide a focal point for contact with WMO/CMM for questions in regard to data management, data within the IODE system which would be important to a wave forecasting programme;

- Further develop and describe the mechanisms to acquire and effect the exchange of measured wave data and of wave data products and presentations of use to programmes and end users of the IODE system;

- Continue to assist, as necessary during the intersessional period with the resolution of problems that occur in the exchange of measured wave data;

- Continue to review and assess the use and suitability of the wave data subsets and report to the next meeting of the Working Committee.

RESOLUTION IODE-XI.3

DATA CENTRE SERVICES

The Working Committee on International Oceanographic Data Exchange,

Noting the numerous requests for increased information about the data centre services and products,

Recognizing that increased emphasis by IOC/IODE on the role of information management will require an expanded information flow about data products,

Realizing the urgent need of co-operative and international global experiments such as TOGA and WOCE for oceanographic data management systems which will include the timely production of global or oceanic scale data presentations,

Recommends the extension of the period of operation of the Task Team on Development of IODE Data Centre Services for the next intersessional period with revised Terms of Reference:

- Examine the data products and services provided by different oceanographic data centres, and make recommendations to the WC on IODE on the publication of a catalogue of typical data products, with indications of their typical uses and users;

- Review and collate the requirements already expressed by CCCO, SCOR, and the IODE Task Team on Ocean Data Management for Climatic Studies, in order to identify the principle oceanographic variables, parameters, presentation methods, spatial and temporal resolution, interpolation techniques, gridding, and other specifications to define data products which will meet their needs. To identify a small number of data types which could be considered for the most urgent attention within the capabilities of the IODE system;

- Report to the WC on IODE on the technical and resource implications of preparing standard data products and their scientific usefulness;

Recognizing further the need for supporting data products for large-scale international oceanographic programmes,

Noting that some international organizations already have experience and capabilities in the production of timely global data products,

Requests the Chairman of the Working Committee on IODE and the Secretary of IOC to collaborate with appropriate international organizations such as WMO and FAO, regional organizations such as ICES, international bodies such as SCOR, and

programmes such as UNEP, WCRP and CCCO, to identify their requirements for oceanographic data centre services, with a special emphasis on data products.

RESOLUTION IODE-X.4

DNP/NOP ANNOUNCEMENT

The Working Committee on International Oceanographic Data Exchange,

Noting with satisfaction the progress made by the Task Team on Review of DNP/NOP during the intersessional period,

Taking into account the many recommendations and actions that have been taken by the Working Committee over the years,

Appreciating the increasing efforts of IOC Member States who are currently providing DNP/NOP Announcement to the IOC Secretariat,

Recommends

- the concept of DNP be changed and that DNPs and NOPs announcements should be separated when dealing with them in IODE literature and discussion;

- NOP be announced well in advance with the intention of informing other Member States on planned research cruises, so that IOC Member States may co-ordinate research efforts and arrange for shipboard training opportunities;

- DNP be announced after the completion of cruises or other data acquisition programme with the intention to exchange internationally the data resulting from all or part of its oceanographic programme,

Decides to continue the work of the Task Team on DNP/NOP announcements for one more intersessional period with the same terms of reference as provided by IODE-X with the addition of new responsibilities:

- Prepare revised text of the brochure on NOP and DNP announcement;

- Write a chapter containing new descriptions of the procedure of NOPs and DNPs announcements in the new edition of the IOC Manuals and Guides No:9 on International Oceanographic Data Exchange.

- Study the possibilities of maintaining DNP/NOP information on a computer file.

RESOLUTION IODE-XI.5

MARINE POLLUTION DATA

The Working Committee on International Oceanographic Data Exchange,

Noting the rapidly accumulating amount of marine pollution data in several countries and the future need for the international exchange of such data,

Recognizing that the lack of an internationally accepted quality control system is one of the main obstacles in the field of marine pollution data exchange,

Confirming that the future exchange format should be GF-3 compatible,

Realizing the need for co-operation between IODE and GIPME, and between IODE and ICES in developing suitable formatting systems,

Recommends those IOC members and countries in need of a reporting format for pollutants in biological material to use the ICES interim format, or GF-3 format, and feed back their experience either to the Task Team or to ICES,

Decides to renew the "Task Team on Marine Pollution Data Exchange" with redefined Terms of Reference:

- Study the different existing data formatting systems for reporting and exchanging marine pollution data in biomaterial, water and sediments, and make recommendations on their use;
- Study ways of ensuring the quality control and documentation of chemical data submitted for international exchange in collaboration with the GIPME Group of Experts on Methods, Standards and Intercalibrations;
- Study ways of providing access to information on pollution data, in collaboration with the Group of Experts on Marine Information Management and the Group of Experts on Format Development;
- Develop guidelines for the recording and archiving of marine pollution data and act as an advisory group on matters in this field.

RESOLUTION IODE-XI.6

EXCHANGE OF MARINE GEOLOGICAL AND GEOPHYSICAL DATA

The Working Committee on International Oceanographic Data Exchange,

Recalling Resolution XII-2 of the twelfth session of the IOC Assembly adopting the Programme of Ocean Sciences in Relation to Non-Living Resources (OSNLR) and EC-XIV.19 of the fourteenth session of the Executive Council of IOC endorsing the collaboration between IOC and UN (OETB) for OSNLR,

Noting the increasing demands for marine geological and geophysical data including those that are resource oriented by developed and developing countries,

Noting also the establishment of World Data Centre-A for Marine Geology and Geophysics,

Appreciates the co-sponsorship of UN(OETB) in OSNLR,

Decides to change the name of the existing Task Team to the Task Team on Exchange of Marine Geological and Geophysical Data, to review the status of existing data management systems with regard to marine geological and geophysical data and to advise the Committee on ways to encourage and increase the international exchange of such data with the following revised Terms of Reference:

- Identify the most pressing needs of the international community for marine geological and geophysical data exchange;
- Review the status of existing data management systems, including inventories, with regard to marine geological and geophysical data, including resource oriented data, needs within the IODE systems and in other relevant international organizations;
- Consider data exchange formats related to newly developed technology (e.g., multi-beam echo sounders);
- Advise the Committee and the Group of Experts on Format Development, as necessary, on parameters to be included in additional standard GF-3 marine geological and geophysical data subsets;
- Advise the Committee on ways to encourage and increase the international exchange of such data;

Urges IODE and its subsidiary bodies, other relevant international organizations and member states to continue efforts to collect and exchange data related to marine geology and geophysics.

RESOLUTION IODE-XI.7

OCEAN DATA MANAGEMENT FOR CLIMATE STUDIES AND APPLICATIONS

The Working Committee on International Oceanographic Data Exchange,

Noting the importance of oceanographic climatological data for the studies of the dynamics of the World Oceans and for the World Climate Research Programme, in particular,

Recognizing with appreciation the decision of the joint IOC/SCOR-CCCO to consider the Working Committee on IODE as the main means for international exchange of non-real-time oceanographic data,

Resolves that the Task Team on Ocean Data Management for Climate Studies be re-established with the revised Terms of Reference:

- Keep itself informed of WCRP-Oceanography (WCRP-O) Programme development;
- Study the use of the IODE System and identify new elements required in the data management of WCRP-O;
- Provide expert advice as requested to CCCO and other bodies on ocean data management working closely with colleagues in IGOSS;
- Assist in defining the objectives of those NODCs which wish to establish RNODCs in climate-related areas by approved procedures;
- Supervise the production of the catalogue of long time series.

RESOLUTION IODE-XI.8

TRAINING IN MARINE DATA AND INFORMATION MANAGEMENT

The Working Committee on International Oceanographic Data Exchange,

Noting with satisfaction the activities of a number of National Oceanographic Data Centers in providing its experience and facilities for training specialists from developing countries,

Noting further the proposals made by Argentina and China to arrange training courses in different fields of oceanographic data management for the countries of the region,

Realizing the importance of strengthening activities of the Committee in the TEMA programme of the IOC through close co-operation with regional offices of IOC and the IOC Working Committee for TEMA,

Expresses its appreciation to Argentina, China, Japan, France, UK and USA for their kind offers, to arrange training courses in marine data and information management,

Decides to establish a Task Team for IODE/TEMA to:

- Provide a focal point for assessing in co-operation with the IOC regional offices, regional needs for training, education and mutual assistance for developing countries in order that they can actively participate in the IODE programme;
- Solicit assistance from developed countries in establishing programmes to meet identified training and assistance needs;

- Provide advice to the Chairman of the WC/IODE and the Secretary of IOC regarding future TEMA activities;

- Provide expertise and assistance to all subsidiary bodies of the Committee in all activities pursuant to TEMA requirements.

RECOMMENDATION IODE-XI.1

GROUP OF EXPERTS ON RNODC's

The Working Committee on International Oceanographic Data Exchange,

Recognizing the progress made in the development of RNODC network and the respect gained by the programme among IOC Member States,

Taking into account new horizons identified at the eleventh session of the Working Committee,

Acknowledging that the accomplishment of its aims and objectives can be facilitated after the publication of the Guide on RNODCs which outlines rules and procedures for the accreditation of new RNODCs,

Recommends that the Group of Experts on RNODCs will continue its activities with revised terms of reference given below which explicitly reflect a vital relationship with the World Data Center System:

- Refine guidelines necessary for the development of effective relationships between RNODCs and other components of IOC;

- Further develop functions and obligations of participants in the RNODC scheme, including data processing, exchange, services and training;

- Review and advise to the extent practicable, the operational status of the RNODC system including discussions with newly proposed RNODCs, screening of applicant RNODCs, general oversight and co-ordination of the system, and advise the Chairman of the Working Committee and the Secretary of IOC, on the numbers and kinds of participating RNODCs;

- Maintain close and continuing working relationships, as necessary, with Directors of accredited Responsible National Oceanographic Data Centers and World Data Centers.

RECOMMENDATION IODE-XI.2

MEDI ENHANCEMENT

The Working Committee on International Oceanographic Data Exchange,

Noting the efforts of the IOC Secretariat that have resulted in the recent growth of the MEDI data base to more than 270 file descriptions from more than 58 sources,

Appreciating the steps taken by WMO to collaborate with IOC when it designed the INFOCLIMA referral service,

Welcoming the offer of France to aid in the further development of MEDI, by providing an on-line service on an experimental basis,

Recommends the IOC Secretariat to contact the WMO Secretariat and establish procedures for exchange of MEDI and INFOCLIMA marine data descriptions in order to minimize the impact on input centres and maximize both the MEDI and INFOCLIMA data bases,

Recommends further that the IOC Secretariat provide a copy of the MEDI data base to France so that they may make the information available on-line to interested NODCs and DNAs as a pilot project for MEDI,

Requests the proposed new Group of Experts on Marine Information Programmes to study how MEDI can more effectively meet the needs of IOC Programmes and Regional Subsidiary bodies, data centres and users.

RECOMMENDATION 3

IGOSS AND IODE CO-OPERATION IN THE FIELD OF OCEANOGRAPHIC DATA ARCHIVING AND EXCHANGE

The Working Committee on International Oceanographic Data Exchange,

Recognizing the importance of the timely availability in data archiving centres of IGOSS data exchanged over the GTS, for use in World Climate Research Programme activities and for other applications,

Noting that the present procedures for IGOSS data archiving do not fully meet the requirements for the availability of archived data in time frames from a few months to one or two years,

Considering that an urgent review of these procedures should include the incorporation of IGOSS data control procedures and IODE data formats in the IODE archive scheme,

Recommends that the Secretary of IOC proceed with arrangements for the IGOSS-IODE meeting of experts proposed by the Informal Consultative Meeting on Oceanographic Climatological Data Management (Hamburg, August 1983) in 1984 and provide the following direction to that meeting:

- The GF-3 format should be used for the exchange of the data received in the BATHY/TESAC code form between IODE data centres and for the provision of data to other end users from the IODE RNODC-IGOSS;
- The international archival formats should include provision for quality control flags;
- The revised procedures should conform where possible with the principles of IODE as described in the Manual on International Data Exchange, but should recognize and accommodate the practicalities and realities of real time and near real time data processing systems.

Further recommends that the IOC and the WMO continue to arrange for informal meetings of experts drawn from IODE and IGOSS to ensure and to assist the functioning of the IGOSS/IODE interface,

Recognizing further that the present Manual for IGOSS Data Archiving and Exchange is seriously out of date, and that it is extremely important to provide end users such as the World Climate Programme with up-to-date, accurate, documentation of data procedures,

Requests the Secretary of IOC to commission the services of a consultant to revise the Manual on IGOSS Data Archiving and Exchange to describe accurately the current procedures, and to incorporate any changes arising from the meeting of IGOSS-IODE experts on the subject.

RECOMMENDATION IODE-XI.4

IODE'S ROLE IN MARINE INFORMATION MANAGEMENT

The Working Committee on International Oceanographic Data Exchange,

Taking note of the fifteenth session of the Executive Council and its belief that the role of the Working Committee on IODE in information dissemination needs to be expanded, and co-operation with other international organizations should be increased,

Recalling requests of IOC Working Committees and other subsidiary bodies to meet their information requirements,

Taking into account the request of the twelfth session of the IOC Assembly for the Task Team on MIM to discuss implications of additional information activities on the Working Committee on IODE's structure, functions and budget,

Noting with interest the reports of the Chairman of the Panel of Experts on ASFIS, the Group of Experts on MEDI, and the Task Team on MIM, to the session,

Recommends that existing subsidiary bodies in the framework of the Working Committee on IODE subsidiary bodies dealing with information management, be disbanded and a new Group of Experts on Marine Information Programmes created in consultation with other sponsoring agencies collaborating with ASFIS and MEDI, when appropriate, with terms of reference contained in the Annex to this recommendation,

Expresses its belief that to discharge its information functions at the required level the IOC should streamline its present advisory mechanisms in marine information, formalize its marine information programmes and build up its staff capability to carry out this programme,

Emphasizes that staff and financial resources are not available within the current Working Committee on IODE budget to implement IODE's programme in marine information beyond a catalytic role,

Urges the Secretary of IOC to staff the vacant information officer position on marine information at the earliest opportunity and to take the necessary measures to identify sources of extrabudgetary financial resources and associate experts from donor agencies and Member States to implement the recommendations of the Task Team on MIM,

Further urges the Secretary of IOC to develop detailed project proposals for extrabudgetary funding to undertake the priority activities that will be identified in the programme development plan,

Recommends urgently that a consultant be identified to prepare the programme development plan for an international programme in marine information and related activities as outlined in Annex X to the Summary Report of WC/IODE-XI,

Endorses the progress and plan towards the completion of the Handbook on Marine Scientific and Technological Information Resources.

ANNEX TO RECOMMENDATION IODE-XI.4

TERMS OF REFERENCE

(a) Advise the Working Committee on IODE on the policy, development and further implementation of an effective international system for scientific and technical information in science and technology of the marine environment by keeping user requirements under continuing review and ensuring that these requirements can be met adequately;

(b) Identify the policy, technical and financial problems involved in the development and implementation of marine information systems, and make recommendations concerning their solution;

(c) Develop programmes to improve the capability of Member States, particularly developing countries, to benefit from and participate in marine information systems and keep Member States informed on how they might best have access to such systems through the application of information technology;

(d) Report to the Working Committee on IODE on matters with special reference to ASFIS and MEDI pertaining to United Nations and specialized agencies information systems and services related to the marine area;

(e) Represent IOC on inter-agency panels on marine information and related systems such as those required by ASFIS and MEDI.

ANNEX III

LIST OF PARTICIPANTS

PARTICIPANTS FROM MEMBER STATES

ALGERIA

Mr. Ben EL MOULOUD
Directeur de la Recherche
Ministère de l'Energie
80, Avenue Ahmed Ghermoul
Algiers

ARGENTINA

Captain Adolfo J. GIL VILLANUEVA
Director
Centro Argentino de Datos
Oceanograficos (CEADO)
Montes de Oca 2124
Buenos Aires 1271

BRAZIL

Mr. Paulo Roberto VALGAS LOBO
Commander
National Oceanographic Data Center
DHN-Rua Barão de Jaceguai
S/N Niteroi
Rio de Janeiro

BULGARIA

Mr. M.V. GANCEV
Secrétaire de la Commission d'Océanographie
Comité d'Etat pour la Science et le
progrès Téchnique
8, rue Slavianska
Sofia

CANADA

Head of Delegation

Dr. J.R. WILSON
Director
Marine Environmental Data Service
240 Sparks Street, 7th Floor
Ottawa
Ontario K1A OE6

Dr. J. WATSON
Director, Scientific Information
Department of Fisheries and Oceans
240 Sparks Street, 7th Floor
Ottawa
Ontario K1A 0E6

Mr. H.A.C. JONES
Marine Environmental Data Service
240 Sparks Street, 7th Floor
Ottawa
Ontario K1A OE6

CANADA/cont'd

Mr. P.A. BOLDUC
Marine Environmental Data Service
240 Sparks Street, 7th Floor
Ottawa
Ontario K1A OE6

CHILE

Mr. R.E. MONTANER
Chief, Centro Nacional de Datos
Oceanográficos de Chile
Instituto Hidrográfico de la Armada
Casilla 324
Valparaiso

PEOPLE'S REPUBLIC OF CHINA

Head of Delegation

Mr. LUO Chuanwei
Deputy Director
Institute of Marine Scientific and
Technological Information
National Bureau of Oceanography
P.O. Box 74
Tianjin

Mr. XU Haoding
Chief of Division of Science and Technology
Institute of Marine Scientific and
Technological Information
National Bureau of Oceanography
P.O. Box 74
Tianjin

Mr. MAO Bin
Institute of Marine Scientific and
Technological Information
National Bureau of Oceanography
P.O. Box 74
Tianjin

COLOMBIA

Mr. Carlos J. LOZANO
Head
Centro Colombiano de Datos Oceanográficos
"CECOLDO"
Mindefensa-Can-Of. 113
Apartado Aéreo 20294
Bogotá

EGYPT

Dr. A.I. BELTAGY
Institute of Oceanography and Fisheries
Kayet Bey
Alexandria

FRANCE

Head of Delegation

Mr. G. STANISLAS
Centre National pour l'Exploitation des Océans (CNEXO)
66, Avenue d'Iéna
75116 Paris

Dr. Marthe MELGUEN
Head
National Bureau for Oceanic Data (BNDO)
Centre Océanologique de Bretagne (COB/CNEXO)
B.P. 337
29273 Brest

FINLAND

Dr. M. PERTTILA
Institute of Marine Research
P.O. Box 33
SF 00930 Helsinki 93

FEDERAL REPUBLIC OF GERMANY

Head of Delegation

Mr. Dieter KOHNKE (Chairman)
Deutsches Hydrographisches Institut
Deutsches Ozeanographisches Datenzentrum
Postfach 220
D-2000 Hamburg 4

Dr. Ulrich BRÜLL
Bundesforchungsanstalt für Fischerei
Iu D Stelle
Palmaille 9
2000 Hamburg 50

ITALY

Dr. Beniamino MANCA
Osservatorio Geofisico Sperimentale
PO Box 2011
34016 Trieste

JAPAN

Dr. Yoshio IWABUCHI
Director
Japan Oceanographic Data Centre
No 3-1, 5-Chome
Tsukiji
Chuo-Ku
Tokyo

MAURITANIA

Mr. Sy Moussa HAROUNA
Directeur
Centre National de Recherche océanographique et des Pêches
B.P.22
Nouadhibou

NORWAY

Head of Delegation

Dr. Reidar Sverre LEINEBØ
Norsk Oseanografisk Datasenter
P.O. Box 4285
5013 Nygaardstangen

Ms. Inger SVENSEN
Norsk Oseanografisk Datasenter
P.O. Box 4285
5013 Nygaardstangen

THE NETHERLANDS

Mr. P. Geerders
The Netherlands Centre for Oceanographic Data
P/a K.N.M.I.
Wilhelminalaan 10
Postbus 201
3730 AE De Bilt

PAKISTAN

Dr. G.S. Quraishee
Director
National Institute of Oceanography
37-K Block 6
Pechs
Karachi

SWEDEN

Mr. Jan SZARON
National Board of Fisheries
Institute of Hydrographic Research
Box 2566
S-40317
Gothenberg

THAILAND

Ms. Absornsuda SIRIPONG
Marine Science Department
Faculty of Science
Chulalongkorn University
Bangkok 10500

TURKEY

Head of Delegation

Mr. Hüseyin Yüce
Acting Chief Turkish NODC
Seyir Hidrografi ve Osinografi
Dairesi Baskanligi
Cubuklu
Istanbul

Lt. S. Kamil Yüceoral
Chief of the Standards and International Affairs
Dz. K.K. P.P. Bsk
Bakanliklar
Ankara

TRINIDAD AND TOBAGO

Mrs. Leonore S. DORSET
Mission of Trinidad and Tobago
to the United Nations
801 2nd Avenue
New York
New York 10017

UNITED KINGDOM

Head of Delegation

Dr. N.C. FLEMMING
Head
Marine Information and Advisory Service
Institute of Oceanographic Sciences
Wormley, Godalming
Surrey

Dr. M.T. JONES
Head, MIAS Data Banking Service
Institute of Oceanographic Sciences
Bidston Observatory
Birkenhead, Merseyside L43 7RA

Mr. A. VARLEY
Head
Library and Information Services
Marine Biological Association of the
United Kingdom
Citadel Hill
Plymouth, PL1 2PB

UNION OF THE SOVIET SOCIALIST REPUBLIC

Head of Delegation

Dr. V.I. SMIRNOV
Director
All-Union Institute of Hydrometeorological
Information
USSR State Committee for Hydrometeorology
and Control of Natural Environment
Pavlik Morozov Street 12
Moscow

Mr. E.A. KONYGIN
Chief
Division of International Scientific and
Technical Co-operation
USSR State Committee for Hydrometeorology and
Control of Natural Environment
Pavlik Morozov Street 12
Moscow

UNITED STATES OF AMERICA

Head of Delegation

Mr. Edward RIDLEY (Vice-Chairman)
Director, National Oceanographic
Data Center, E/OC
National Oceanic and Atmospheric
Administration
2001 Wisconsin Avenue N.W.
Washington D.C. 20235

Mr. Robert FREEMAN
Chief, National Environmental Data
Referral Service
National Oceanic and Atmospheric
Administration
3300 Whitehaven Street N.W.
Washington D.C. 20235

Mr. Bruce H NEEDHAM
Chief, Data Services Branch
National Oceanic and Atmospheric
Administration
Satellite Data Services Division
Room 100 World Weather Buildings
Washington D.C. 20233

Dr. Robert A. PEDRICK
Office of Science and Technology F/SI
National Marine Fisheries Service,
National Oceanic and Atmospheric
Administration
3300 Whitehaven Street
Washington D.C. 20235

Capt. John E. NOURIE
Staff CNO
Naval Oceanography Division (OP-952F)
Pentagon
Washington D.C. 20350

Mr. Robert C. Lockerman
Chief
Product Development Branch
US Department of Commerce
National Oceanic and Atmospheric
Administration
2001 Wisconsin Avenue N.W.
Washington D.C. 20235

Mr. Kent H. Hughes
Deputy Director
U.S. National Oceanographic Data Center
2001 Wisconsin Avenue
Washington D.C. 20235

Mr. Douglas R. HAMILTON
US National Oceanographic Data Center
2001 Wisconsin Avenue
Washington D.C. 20235

REPRESENTATIVES OF ORGANIZATIONS

A. IOC ADVISORY BODIES

COMMITTEE ON DATA FOR SCIENCE AND TECHNOLOGY (CODATA)	Dr. D. LIDE Secretary General CODATA/ICSV National Bureau of Standards Washington, D.C. 20234 USA
INTERNATIONAL HYDROGRAPHIC ORGANIZATION (IHO)	Capt. W. HAYES Chairman, Common Exchange Dig. Dig. Data NOAA N/CGZ 1601 Executive Blvd. Rockville, MD 20852 USA
SCIENTIFIC COMMITTEE ON OCEANIC RESEARCH (SCOR)	Mr. J. CREASE Institute of Oceanographic Sciences Wormley, Godalming Surrey United Kingdom

B. ICSPRO AGENCIES

UNITED NATIONS	
- Department of International Economic and Social Affairs (DIESA)	Mr. P.N. Dhar Assistant Secretary-General Office for Development Research and Policy Analysis 2, United Nations Plaza Room DC2-2220 New York, N.Y. 10017
- Ocean Economics and Technology Branch	Mr. Jean-Pierre Lévy Chief 2, United Nations Plaza Room DC2-2050 New York, N.Y. 10017
	Ms. Mary B. FISK Economic Affairs Officer 2, United Nations Plaza Room DC2-2040 New York, N.Y. 10017

B. ICSPRO AGENCIES (cont'd)

UNITED NATIONS	
- Department of Technical Co-operation for Development (DTCD)	Mr. Hans STABE Economic Affairs Officer DTCD United Nations Plaza Room DC1-0720 New York, N.Y. 10017
- Department of Political and Security Council Affairs (PSCA)	Dr. V.V. ZDOROVENIN Senior Political Affairs Officer United Nations Plaza Room S-2684 New York, N.Y. 10017
- Outer Space Affairs Division (OSAD)	Dr. Adigun Ade ABIODUN Expert on Space Applications United Nations Plaza Room 3550-C New York, N.Y. 10017
FOOD AND AGRICULTURE ORGANIZATION (FAO)	Mr. E.F. AKYUZ Chief Fishery Information Data and Statistics Service Via Delle Terme di Caracalla 00100 Rome Italy

C. SUBSIDIARY BODIES

WORLD DATA CENTER - A, OCEANOGRAPHY (WDC-A)	Mr. J. CHURGIN Director, WDC-A NOAA 2001 Wisconsin Avenue, N.W. Washington, D.C. 20235 USA
WORLD DATA CENTER-A FOR MARINE GEOLOGY AND GEOPHYSICS (WDC-A-MGG)	Dr. Michael S. LOUGHRIDGE Director, WDC-A-MGG NOAA/EGC/3 325 Broadway Boulder, Colorado 80303 USA

C. SUBSIDIARY BODIES (cont'd)

SOUTHERN OCEANS PROGRAMME (SOC)	Mr. M. STEIN Institut für Seefischerei Palmaille 9, D-2000 Hamburg 50 Federal Republic of Germany
COMMITTEE ON CLIMATIC CHANGES AND THE OCEAN (CCCO)	Prof. F. WEBSTER College of Marine Studies University of Delaware Newes, DE 19958 USA
INTEGRATED GLOBAL OCEAN SERVICES SYSTEM (IGOSS)	Mr. G.W. WITHEE WSC-1 6001 Executive Blvd Room 103 Rockville, MD 20852 USA
	Mr. Robert E. HUNT Oceanographer National Meteorological Center 5200 Auth Road Camp Springs, MD 20233 USA
GLOBAL INVESTIGATION OF POLLUTION IN THE MARINE ENVIRONMENT (GIPME)	Dr. N.R. ANDERSEN Director Marine Chemistry Program National Science Foundation 1800 G. Street N.W. Washington D.C. 20550

D. OTHER ORGANIZATIONS

UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)	Mr. Peter LEES Chief Computer Unit Palais des Nations 1211 Geneva, Switzerland
- Meiterranean Action Plan (MAP)	Miss Z. Gül YILMAZ Data Processor The Coordinating Unit of MAP Leof. Vas Konstantinou 48 Athens 11635 Greece

D. OTHER ORGANIZATIONS (cont'd)

WORLD METEOROLOGICAL ORGANIZATIONS (WMO)	Dr. G. VERPLOEGH Senior Scientific Officer Case Postale No. 5 CH-1211 Geneva 20 Switzerland
INTERNATIONAL COUNCIL FOR THE EXPLOFATION OF THE SEA (ICES)	Mr. J. SMED Hydrographer Palaegade 2-4 1261 Copenhagen K Denmark
INTERNATIONAL DEVELOPMENT RESEARCH CENTRE (IDRC)	Mr. K. BROADBENT IDRC 60 Queen Street Ottawa Canada

SECRETARIAT IOC

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (IOC)	Dr. I. OLIOUNINE Assistant Secretary Head, Ocean Services Unit IOC (Unesco) 7, Place de Fontenoy 75700 Paris France

ANNEX IV

Introductory Address

by

Mr. P.N. Dhar
Assistant Secretary-General for
Development Research and Policy Analysis
United Nations

Not available at present.

ANNEX V

SOME DATA NEEDS OF THE WORLD CLIMATE RESEARCH PROGRAMME - OCEANOGRAPHY

(Synopsis of talk presented on 10 January 1984)

By Dr. Ferris Webster

The oceanographic component of the World Climate Research Programme (usually referred to as WCRP-O) will challenge oceanographers to develop a data collection and management system to meet the needs of global climate research. TOGA will unite oceanic and atmospheric scientists in a common effort. In order to hold their own, oceanographers will probably have to accept some new ways of doing business. Meteorologists have experience in dealing with global data sets. Will they be content to accept traditional data-collection and management activities on the part of the oceanographers in a mutual study?

WCRP-O anticipates significant data collection through satellites. If acoustic tomography is developed as a tool in this decade, it too will be a big data generator. We will thus be faced with a deluge of data, sometimes of new types, extending over global scales, perhaps with dubious quality control. How will we cope with this?

Among the oceanographers planning the WCRP-O, there is a general lack of recognition of the data management problem. This in turn has meant that there has been a weak link between the scientific planners and the national and international data managers. A far stronger dialogue is needed. On the other side, the data managers must be less complacent about their ability to respond to the need. There will likely be pressure to abandon the established oceanographic data centres in favour of new institutions.

To cope with the challenge of meeting the ocean data needs of the World Climate Research Programme, we should be developing strong links between IODE and the Committee on Climatic Changes and the Ocean (CCCO). The scientific planners should be spelling out their data needs so that realistic management plans can be developed. The data managers must in turn give realistic estimates of what they will need to do the job. Collection, quality control, dissemination, and management of data need to be an integral part of the planning of large-scale ocean climate programmes. At the moment, data management is a poor relative that is too often forgotten by the scientific planners in the excitement of the opportunities for examining a global phenomenon with new technologies.

IMPLICATIONS OF THE UNITED NATIONS CONVENTION ON THE LAW OF THE SEA FOR THE ACTIVITIES OF THE WORKING COMMITTEE ON INTERNATIONAL OCEANOGRAPHIC DATA EXCHANGE

(Summary of a Paper Presented on 10 January 1984 to IODE/UN-OETB Meeting)

N. C. Flemming, Institute of Oceanographic Sciences, United Kingdom

The United Nations Convention on the Law of the Sea has not yet been ratified by a large number of States, but it is prudent that the IOC and IODE should take note of the principles embodied in it, insofar as they affect the future of oceanographic data exchange. The Convention, when fully ratified, will establish a new régime defining several distinct regions, including the Territorial Sea and Extended Economic Zone of coastal States, the High Seas, the International Area, and aspects of special conditions in regional seas. The rights and options available to coastal States, and to research organizations working within the jurisdiction of coastal States, are also established by the Convention.

The Convention defines broad legal principles which should endure for many years. It deliberately does not specify the technical means to attain objectives, since both technical systems and procedures will change quite frequently by comparison. Thus, the IOC/IODE must evaluate the principles, and devise the most suitable technical and procedural means to comply with them.

Marine science is defined as an essential activity which should benefit all mankind, and the necessity to share and exchange information, data, and skills, is repeatedly stressed. The Convention will tend to increase the international flow of data for several reasons: to meet the requirements of co-operative scientific programmes; to support aid and development to developing countries; application of the principle of transfer of data and information from operating organizations to the coastal States within whose jurisdiction they work; transfer of information and data from coastal States to neighbouring disadvantaged or landlocked States; and the sharing and exchange of data within regions. The Convention stresses the need for open and rapid transfer and exchange of data, but suggests no mechanism for this, and provides the option that exchange can be bilateral or through appropriate international organizations.

Conversely, factors working against an increased flow of data within the principles of the Convention would be: possible excessive enforcement of discretionary rights by coastal States to insist on the confidentiality of data; possible frequent use of the discretionary clauses permitting coastal States to forbid organizations to operate within their EEZ after default on the delivery of data; possible excessive bureaucracy and delays in granting permission to conduct research; coastal States may opt not to belong to regional organizations for the exchange of data.

The Member States of the IODE System, whether considered individually or corporately within the IODE System, are presented with a very wide range of choices. The existence of these choices is quite explicit in the Convention, and

is not due to vague principles. The choices fall into the following categories: choice of degree of compliance with the many Articles which are explicitly discretionary or conditional; choice of the use of bilateral or regional, or international channels for data and information transfer; choice of option to enforce confidentiality and penalty clauses; choice of option to transfer data to neighbouring or landlocked States; choice of whether to join regional organizations; freedom to choose all or any practical technical methods and procedures to achieve the objectives within the Principles of the Convention.

The Working Committee for IODE has already developed the technical means and procedures for international data exchange, based on the WDC-RNODC-NODC links, and agreements on data structures and formats. This experience should be used as the foundation for an expanded range of services which will ensure future growth of the system, and fulfilment of the principles of the Convention.

It is suggested that IOC/IODE could develop a recommended Code of Practice for the transfer of data from operating organizations to the coastal States, support the development of NODCs and regional data centres, increase the effort devoted to information exchange, and develop streamlined procedures whereby research organizations can transfer data simultaneously to coastal States, regional centres, and the RNODC-WDC System. In addition, IOC/IODE should consider offering its advice and services to assist the Authority in the management of data and information. Since the management of data and information promotes science and technological development, IOC/IODE should continue and increase its efforts in training personnel in these activities, especially with regard to the needs of developing countries.

ANNEX VI

PROGRAMME DEVELOPMENT AND MANAGEMENT PLAN FOR AN INTERNATIONAL PROGRAMME IN MARINE INFORMATION AND RELATED ACTIVITIES (IPMIRA)

Objective: A plan is needed in order to place the development of IPMIRA on a stable, long-term basis that will engender the understanding and confidence of international and national marine community, particularly in the developing countries; international agencies; and potential sources of support. The plan should detail the information needs that must be met and show how IPMIRA proposes to meet these needs in the short, medium and long term. The consultant is to prepare a draft plan according to the following outline. The plan is to be submitted to an invited group of experts for review and subsequently to the Executive Council of the Intergovernmental Oceanographic Commission for approval.

1. Summary of Background of Marine Information and Related Programmes

   a. Stages and milestones in the development of international marine information programmes such as ASFIS, MEDI, MACTIS, INFOTERRA, INFOCLIMA, AGRIS, DEVSIS;

   b. Products and services developed;

   c. Present organization, status and future plans.

2. The User Community and Its Needs

   a. Scope and boundaries of marine information;

   b. Types, number and distribution of users by country, industry/mission and profession/discipline;

   c. How user needs are communicated, recognized, certified and acted upon (international committees, assemblies, bilateral programmes, regional bodies, surveys, voluntary assistance etc.;

   d. Sources of Demand for Information:

      i) Policy related (Law of the Sea, national jurisdiction, ownership of resources, etc.;

      ii) Scientific research support;

      iii) Technology transfer and regional/national development;

   e. Analysis of Needs and Evaluation of Current Products and Services with Special Consideration of Developing Country Needs:

      i) Institutional - libraries, information centres, data centres;

ii) Reference and referral services;

iii) Document delivery;

iv) Translations;

v) Advisory/extension service (technology information for practical use).

3. Meeting Needs: Programmes and Priorities

a. Building an Infrastructure :

i) Developing regional and national institutions;

ii) Technical assistance;

iii) Training of Marine Information Specialists;

iv) Electronic communication among participating centres;

v) Standards, manuals and authority lists;

vi) System development and linkages with other national, regional and international systems.

b. Developing needed products and services:

i) Improving and extending existing products and services;

ii) New products and services.

4. Meeting Needs: Organization and Governance

a. Policy Development and Ratification:

i) Consultative and advisory mechanisms;

ii) Decision making mechanisms.

b. Finance:

i) Sources;

ii) Means of implementation (grants, trust funds, etc.)

c. Operating Organization:

i) Central secretariat and management functions;

ii) International agency and regional bodies' functions;

iii) National agencies;

iv) Role of private organizations.

d. National and Regional Participating Centres:
   i) Criteria for selection;
   ii) Responsibilities and conditions;
   iii) Privileges and entitlements.

e. Oversight and Evaluation

5. Implementation Plan in Phases

a. Short term, high priority actions and cost estimates;

b. Medium term actions;

c. Long term actions.